PAINT and VARNISH

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

If YOU ARE
LOOKING FOR A LOW COST,
GOOD COLOR GLOSS OIL

Investigate

NU GLO

by

NEWPORT

A new, non-staining gloss oil that can be used satisfactorily in even pale whites. Has excellent properties and offers definite production economies. Start saving quickly by ordering today. Samples on request.

NEWPORT INDUSTRIES, Inc.

230 PARK AVENUE NEW YORK 17, N. Y.

EPON® RESIN does it!

Paint job still sound after four years of 100% humidity, high temperature ... in antibiotics plant

All surfaces, except stainless steel, are protected by Epon resin-based paint formulated by David E. Long Corp., New York 17, N.Y.

HERE'S HOW...

PAINT LEADS A HARD LIFE in the steamy antibiotics plant of the New York Quinine and Chemical Works. Day in and day out, paint endures live steam and high temperatures. The coating on the processing equipment is exposed to hydrochloric acid and caustic soda. All surfaces take frequent hosing and scrubbing.

No ordinary paint would stand up to such usage. Epon resin-based coatings were applied in the Spring of 1952 throughout the plant . . . on walls and ceilings, on all metal piping except stainless steel, on all processing equipment. This Epon resin ester paint, dried at room temperatures, has given complete resistance to corrosion by chemicals and moisture, excellent adhesion to metals, plaster and concrete, and because of its glossy finish has reduced dust settling.

Four years after it was brushed on, the Epon resin paint looks sound and new. And the Chief Engineer has no intention of repainting this year!

Paint users everywhere now know the advantages of Epon resin-based formulations. Your Shell Chemical salesman will explain how Epon resins can improve your own formulations. Write or telephone for the brochures, "Epon Resins for Surface Coatings" and "Epon Resin Esters for Surface Coatings."

Epon resins are the epoxy polymers made exclusively by Shell Chemical Corporation.

SHELL

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION

380 Madison Avenue
New York 17, New York

Atlanta • Boston • Chicago
Cleveland • Detroit • Houston
Los Angeles • Newark • New York
San Francisco • St. Louis

IN CANADA
Chemical Division, Shell Oil Company of Canada, Limited
Toronto • Montreal • Vancouver

How do you like your resins?

SCHENECTADY OFFERS THEM ALL!

No need to limit your production to one or two forms of resins. Get them in the form that best fits your needs. Schenectady offers a full range of resins in liquid, lump, crushed, or powdered form. Select a standard or special phenolic, alkyd, terpene, maleic, resorcinal, epon or silicone resin.

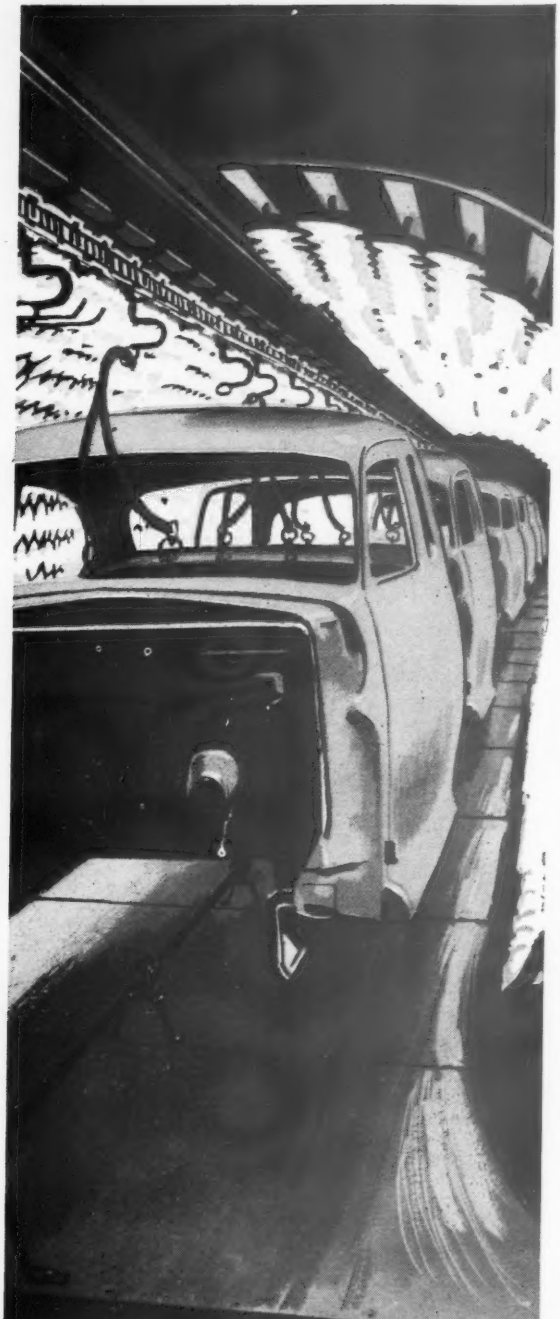
As specialists in synthetic resin development and manufacture, Schenectady has the latest in production facilities in its three plants. Autoclaves of various sizes, both stainless and glass lined, are used to produce resins of superior quality.

Schenectady can ship your order in fibre or steel drums, tank wagons or tank cars. For technical service, Schenectady has trained representatives ready to tackle your resin problem on the spot.

When it's a question of resins, the answer is Schenectady.

SCHENECTADY

SCHENECTADY RESINS • DIVISION OF SCHENECTADY VARNISH COMPANY • SCHENECTADY, N.Y.



Improve the properties
of your baking enamels with...

RCI's NEW LINE OF MELAMINE RESINS

Reichhold is proud to announce a new line of aromatic solvent-soluble melamine-formaldehyde resins which give many improved physical properties to baking enamels for automobiles, appliances and many other products. These new resins will:

1. SPEED BAKING—Give you fast cures. Boost your production and save fuel.

2. IMPROVE COLOR—You can formulate enamels that have better initial color and yellow less upon exposure to heat and light than those made with urea-formaldehyde resins.

3. REDUCE HAZING—Your enamels will have a high initial gloss and exhibit little tendency to drop in gloss when baked at high temperatures and when exposed to light.

4. INCREASE HARDNESS AND CHEMICAL RESISTANCE—These RCI melamine-formaldehyde resins impart greater hardness to enamels than do urea-type resins. They also give enamels high resistance to chemical attack.

If you formulate baking enamels, write for information on the new RCI SUPER-BECKAMINE line of melamine-formaldehyde resins.

Creative Chemistry...
Your Partner in Progress

RCI

REICHHOLD

Synthetic Resins • Chemical Colors • Industrial Adhesives • Plasticizers
Phenol • Formaldehyde • Glycerine • Phthalic Anhydride • Maleic Anhydride
Sodium Sulfite • Pentaerythritol • Pentachlorophenol • Sulfuric Acid

REICHHOLD CHEMICALS, INC., RCI BUILDING, WHITE PLAINS, N. Y.

PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 46 JULY, 1956 NO. 8

NEXT ISSUE

"Coating for Use with Cathodic Protection" is the title of an interesting feature for the August number. The author covers such important factors as basic principles of electrochemical corrosion, paint protection by organic coatings, principles and practical aspects of cathodic protection, and paint coatings for use with cathodic protection.

Published Monthly by
Powell Magazines, Inc.
Executive and Editorial Offices
855 Ave. of Americas
New York 1, N. Y.
BRyant 9-0499

JOHN POWELL, *Publisher*
ANTHONY ERRICO, *Editor*
MONROE ALTER
Ass't. Editor
A. L. BENDER
Production Manager
WM. R. KELLY
Circulation Manager
PHILIP J. SEAVEY
Advertising Manager
ALAN P. DANFORTH
855 Ave. of Americas
New York 1, N.Y.
BRyant 9-0499
DUNCAN P. MACPHERSON
700 S. Washington Sq.
Philadelphia, Pa.
LOmbard 3-9982
JONES & LYNCH
228 N. La Salle St.,
Chicago 1, Ill.
State 2-5096
Advertising Representatives
MCDONALD-THOMPSON
West Coast Representatives

FEATURES

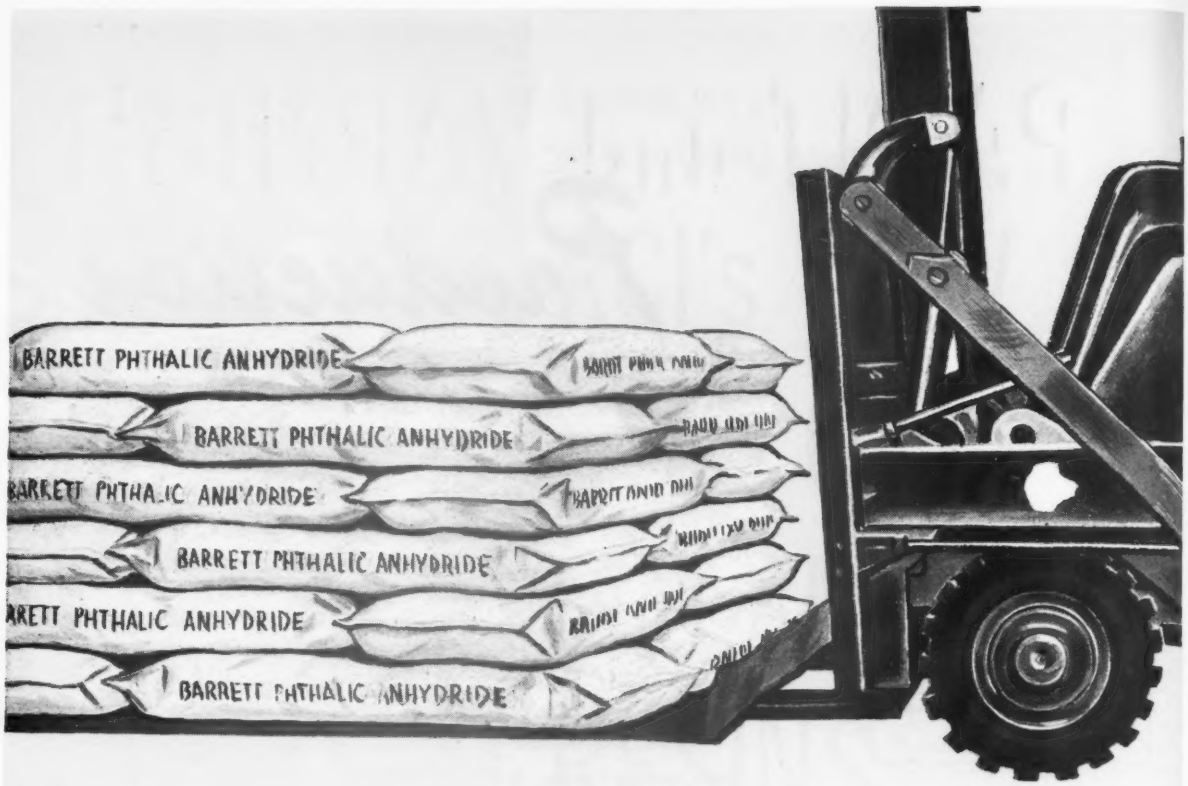
Lacquer for Plastics, *by Herman G. Philips, Jr.* 27
Vapor Disposal Unit for Removing Fumes in Varnish Cooking 30
Epoxidation and Uses of Epoxides in Coatings, Part IV (conclusion), *by Dr. Daniel Swern* 32
The Coating Corner, *by Phil Heiberger* 37

DEPARTMENTS

Comment 7
News 39
Licensing of Jelled Paint 39
Painting Campaign Announced 41
Credit Plan for Paint Machinery Inaugurated 42
Usage of Molybdate Orange Grows 55
Southern Club Section Formed 82
New Raw Materials and Equipment 57
Thickness Gage 57
Filling Machine 58
Lined Container 61
Personnel Changes 63
Patents 72
Water-Soluble Casein 72
Polyvinyl Acetal Resin 75
Extending Drying Oils 78
Abstracts 87
Calendar of Events 90
New Books 93
Technical Bulletins 94

MEMBER BUSINESS BPA PUBLICATIONS AUDIT, INC.

PAINT and VARNISH PRODUCTION is published monthly except semi-monthly in February at Easton, Pa. by Powell Magazines, Inc. John Powell, president; Ira P. MacNair, vice-president and treasurer; Alice L. Lynch, secretary. Entered as second class matter at Post Office at Easton, Pa., Jan. 30th, 1952, under the Act of March 3, 1879. Subscription rates: United States and Possessions, $3.00 a year, $5.00 for two years, $10.00 for five years. Single copies 50c each. Canada, $4.00 a year. Pan American Countries, $4.00 a year. All other countries $8.00. Editorial and business office: 855 Avenue of the Americas, New York 1, N. Y. BR-9-0499.



WHICH PHTHALIC PACKAGE SUITS YOU BEST?

You can obtain phthalic anhydride in molten or flake form—whichever will serve your particular operation best—from the world's largest producer—Barrett. For care and speed of handling the flake form, we arrange unitized shipments in box cars or trucks. Carload prices apply on mixed carloads of phthalic and maleic anhydrides and fumaric acid. All Barrett bags are uniformly flattened by a special "kneading" operation, which makes them more compact for handling and warehousing.

For the manufacturer who is able to enjoy the economy offered by molten phthalic, Barrett ships it in stainless steel tank cars or trucks. If you believe your operation warrants molten handling we will be glad to discuss its advantages at your convenience. But whatever the type of your operation, your Barrett representative will be glad to help you to evaluate your handling requirements. He is at your service.

Barrett®

BARRETT CHEMICALS

BARRETT DIVISION, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N.Y. In Canada: The Barrett Company, Ltd., 5551 St. Hubert Street, Montreal, Que.

Allied Chemical

WORLD'S LARGEST PRODUCER OF PHTHALIC ANHYDRIDE

Editorial Comment

July, 1956

Imperative to Use All Talents

A RECENT independent survey made by the Manufacturing Chemists' Association revealed that the nation will face a critical shortage of scientists and engineers during the next ten years. In terms of numbers, more than 700 executives of the chemical industry attending the 84th annual meeting of the Manufacturing Chemists' Association heard that by 1965 we will have a shortage of some 457,000. The chemical industry alone is expected to have a "probably shortage" of 93,000 scientists and engineers within the next ten years.

In an effort to develop new estimates of the significance of the technical manpower shortage, this survey showed that at the present time there are 884,000 scientists and engineers employed in the United States. Of this number 713,000 are in industry with 77,000, or 8.7 percent of this total employed in the chemical and allied industries.

It was pointed out that by 1956 the supply of scientists and engineers will increase to 1,223,000 but that 1,680,000 will be needed, making an overall shortage of 457,000. As far as the chemical industry is concerned, it will need 199,000 technologists by 1965 but can obtain only 106,000.

The effect of the current and future shortages of technical manpower could considerably threaten the growth of American industry, according to Glen Perry of DuPont, vice-chairman of the MCA education advisory committee.

"If the needs of the country and of the chemical industry are to be met," Mr. Perry said, "we must immediately begin to double the number of junior high school students who become scientists and engineers—and time may very well prove that we are under-estimating our needs." In this connection, Mr. Perry described in detail a proposal covering an initial five-year educational program under the auspices of the Manufacturing Chemists' Association to increase the interest of young men and women in careers in science. The program will cooperate actively with schools at every level from the sixth grade through college.

Unquestionably from a long range standpoint the above proposal is the only approach to the problem of increasing our technical manpower.

However, from the immediate standpoint, perhaps we could consider utilizing the services of more of older technical personnel who are facing retirement during this critical period. It might be prudent for management to extend the retirement age of this particular group and even to gain, on a part time basis, the services of those technologists already retired.

"The Coating Corner"

WITH this issue we are pleased to announce the beginning of a new monthly feature by Phil Heiberger entitled, "The Coating Corner."

While Mr. Heiberger needs no introduction to many of our readers, his background in the paint field fits him admirably as the conductor of this feature. He received his Ph. D. from University of Texas in 1953 and is currently associated in the Oil and Resin Laboratory of the National Lead Company.

His most recent and well received contribution to this publication was "Atoms for Paint" (October, 1955) in which he discussed how radioisotopes and nuclear energy can further paint progress.

Mr. Heiberger outlines the purpose of his reflections on page 37 and we recommend your regular attention to it.

Make more use of the

LO

LOW OIL ABSORPTION

MAPICO® YELLOWS

Here are the special advantages they provide:

1. **HIGH GLOSS**—a natural result of low vehicle absorption and vehicle-seeking habit.
2. **LOW DRY BULK**—requires approximately ⅓ less storage space.
3. **EASIER WETTING—FASTER MIXING**—LO Yellows make higher mill-base concentrations—mix faster—save processing time.
4. **LOW SOLUBLE SALT CONTENT**—this characteristic makes the LO Yellows ideal for emulsion paints.
5. **OTHER ADVANTAGES**—high hiding, chemical stability, light fastness and resistance to acids and alkalies make these pigments exceptionally useful.

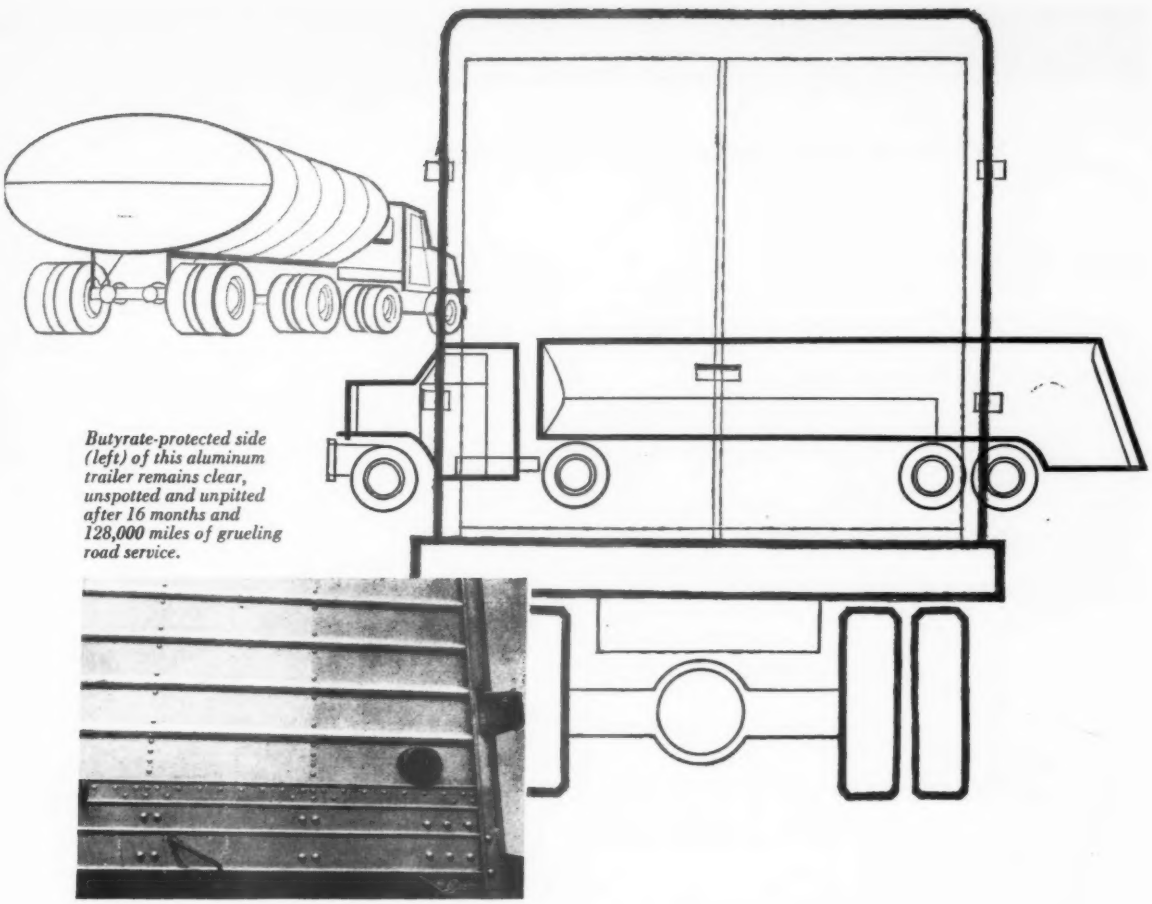
● COLUMBIAN COLLOIDS

PURE OXIDES OF IRON

COLUMBIAN CARBON COMPANY
MAPICO COLOR DIVISION
380 MADISON AVENUE, NEW YORK 17, N. Y.

BRANCH OFFICES AND AGENTS

Akron, Columbian Carbon Co. • **Atlanta,** Chas. L. Burks & Co. • **Boston,** Columbian Carbon Co. • **Chicago,** The Cary Co. • **Dallas,** Roy A. Ribelin Distributing Co. • **Detroit,** Columbian Carbon Co. • **Houston,** Roy A. Ribelin Distributing Co. • **Kansas City, Mo.,** Abner Hood Chemical Co. • **Los Angeles,** Martin, Hoyt & Milne, Inc. • **Louisville,** Wm. B. Tabler Co. • **Minneapolis,** Willard N. Swanson Co. • **New Orleans, La.,** Roy T. Cucullu • **Philadelphia,** Columbian Carbon Co. • **Portland, Ore.,** Martin, Hoyt & Milne, Inc. • **St. Louis,** J. E. Niehaus & Co. • **San Francisco, Seattle,** Martin, Hoyt & Milne, Inc. • **Toronto,** Columbian Carbon Co.



Butyrate-protected side (left) of this aluminum trailer remains clear, unspotted and unpitted after 16 months and 128,000 miles of grueling road service.

Improved protection for outdoor aluminum

ALUMINUM TRAILER BODIES have a brighter future now, thanks to new, clear, durable lacquers made of Eastman Half-Second Butyrate. The performance of Half-Second Butyrate has been tested for almost two years on exposure panels, aluminum trailer trucks and airplanes. The superior weather resistance and general durability of its clear films have been established and commercial lacquers made with this material are now available from leading lacquer manufacturers.

Half-Second Butyrate produces clear lacquer films that show outstanding resistance to breakdown and discoloration by sunlight. These easily-sprayable lacquers also exhibit a high degree of strength, flexibility and all-'round resistance to attack by road salt, hydraulic fluids, hot oil, etc.

Half-Second Butyrate is a dry powder, shipped in 50-pound paper bags, easy to handle and safe to store. It is highly soluble in such economical solvent combinations as toluene and ethyl alcohol.

Improve your lacquer formulations with the many advantages of Eastman Half-Second Butyrate. Our technical staff is ready to work with you in developing formulations. Write for working samples of Half-Second Butyrate.

Eastman CHEMICAL PRODUCTS, INC.

KINGSPORT, TENNESSEE, subsidiary of EASTMAN KODAK COMPANY

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

Where low odor is a factor

use these SHELL SOLVENTS

SHELL SOL 71 AND 72

. . . have no odor, are ideal for interior finishes, polishes and cleaners.

SHELL SOL 140

. . . a slow drying, high boiling, high flash point solvent with a very mild odor.

SHELL 360 SOLVENT

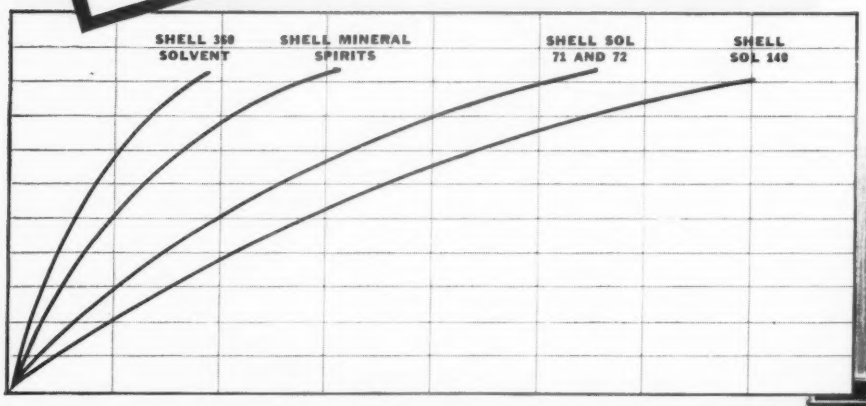
. . . faster evaporation, low odor.

SHELL MINERAL SPIRITS

. . . conventional distillation range, solvent power and drying. Mild odor.

These solvents are recommended for low odor and odorless products.

Detailed specifications of these Shell Solvents are contained in booklet shown. It will be mailed on request.



SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK

National Lead Company, Experimental Test Station, Sayville, Long Island, is set up to develop facts on the durability, beauty, and practicability of house paints. In existence since 1917, it now has 2½ miles of test fences, more than 30,000 active tests.

FOOLPROOF

your exterior paints

with Dutch Boy® "45X"

(Basic Silicate White Lead)

TAKE IT from leading makers of exterior paints: for *uniform* performance, you need lead.

And take it from Sayville, National Lead's Experimental Test Station, "Dutch Boy" Basic Silicate White Lead "45X" *assures* uniform performance. No matter how much exposure conditions – or painting practices – vary!

Think about your white House Paints, for example.

With "45X" – Sayville tests show – you definitely improve self-cleaning. Yet, you preserve film integrity!

In tinted House Paints, you step up film durability with "45X". Also resistance to color changes! In Primers, you step up adhesion.

And so it goes!

Everytime you put "45X" into exterior paints, you improve one property or another underlying *uniform* performance.

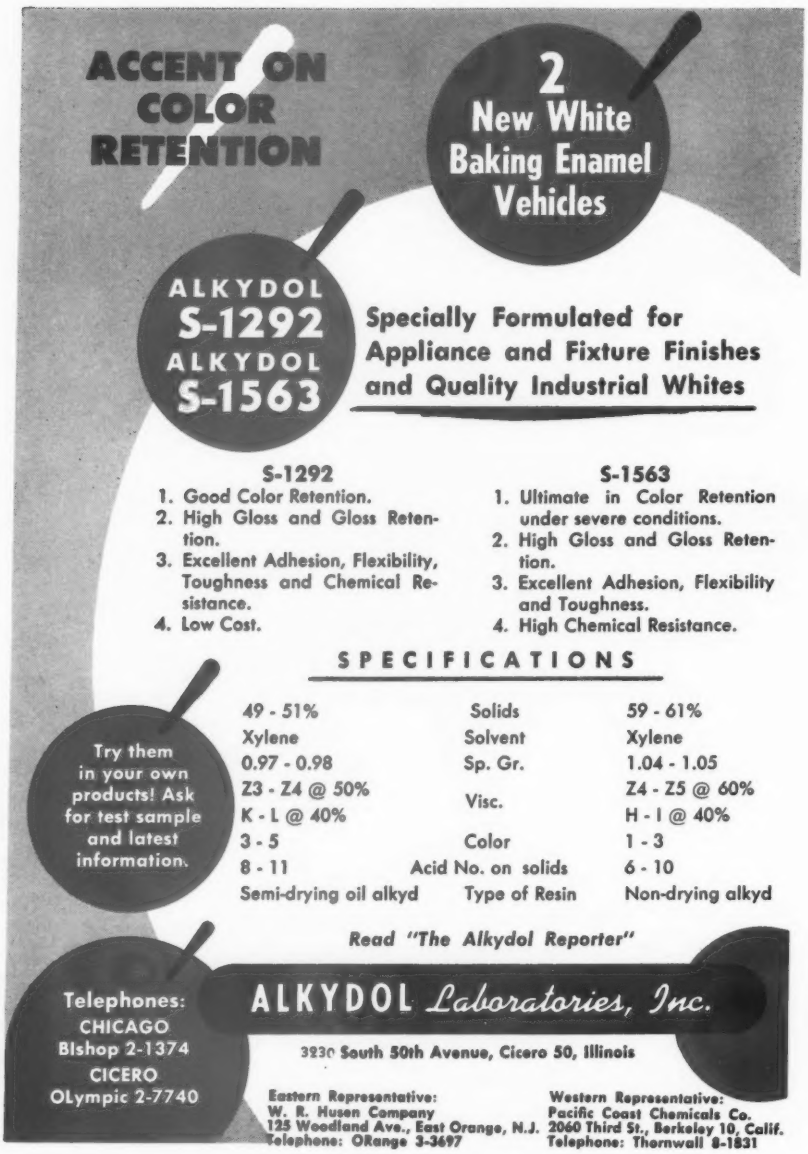
This minimizes complaints. Saves you time. And money! You, you alone, know what it costs to run down complaints yearly. And the complaints you *don't* hear about! Even you don't know what they cost – in repeat business and good-will.

Fewer complaints—
fewer pounds of lead, too!

That's because the reactive portion of each "45X" pigment particle is concentrated at the surface. This makes proportionately larger amounts of lead *available.*

Fewer complaints, fewer pounds of lead! You just can't lose, putting "45X" in your exterior paints!

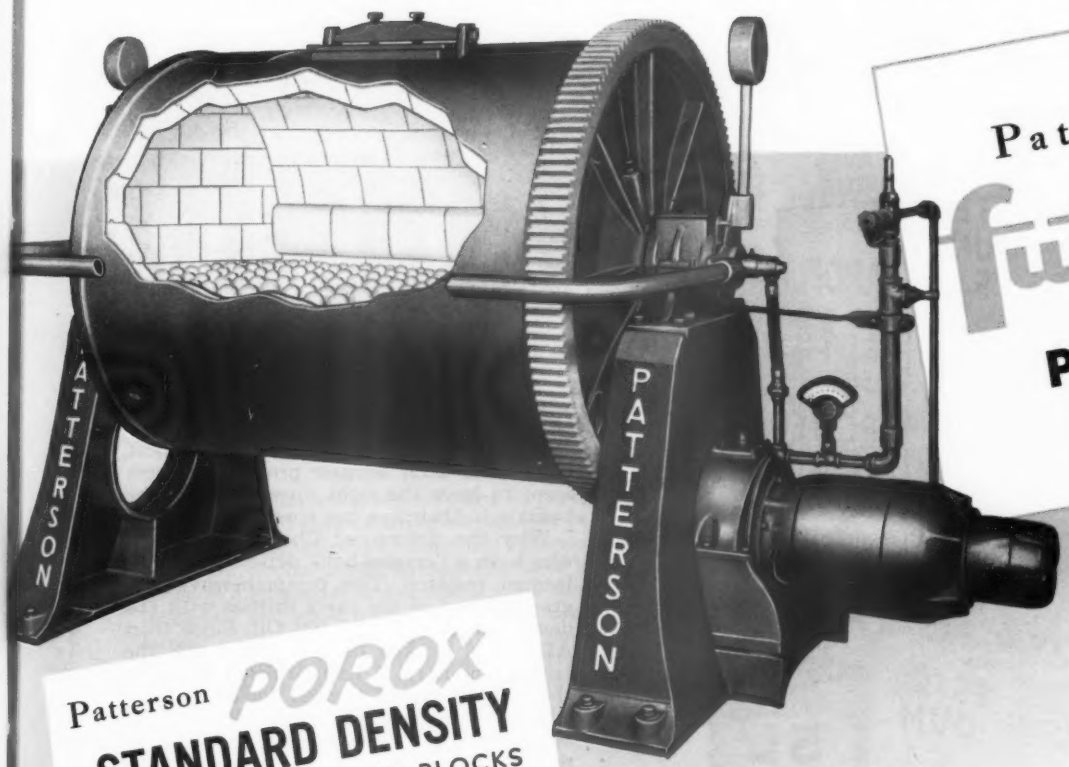
National Lead Company: New York 6; Atlanta; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.). In Canada: Canadian Titanium Pigments Ltd., 630 Dorchester St., W., Montreal.


ACCENT ON COLOR RETENTION
2 New White Baking Enamel Vehicles
ALKYDOL S-1292
ALKYDOL S-1563
Specially Formulated for Appliance and Fixture Finishes and Quality Industrial Whites
S-1292
1. Good Color Retention.
2. High Gloss and Gloss Retention.
3. Excellent Adhesion, Flexibility, Toughness and Chemical Resistance.
4. Low Cost.
S-1563
1. Ultimate in Color Retention under severe conditions.
2. High Gloss and Gloss Retention.
3. Excellent Adhesion, Flexibility and Toughness.
4. High Chemical Resistance.
SPECIFICATIONS
Try them in your own products! Ask for test sample and latest information.
49 - 51% Solids 59 - 61%
Xylene Solvent Xylene
0.97 - 0.98 Sp. Gr. 1.04 - 1.05
Z3 - Z4 @ 50% Visc. Z4 - Z5 @ 60%
K - L @ 40% H - I @ 40%
3 - 5 Color 1 - 3
8 - 11 Acid No. on solids 6 - 10
Semi-drying oil alkyd Type of Resin Non-drying alkyd
Read "The Alkydol Reporter"
Telephones:
CHICAGO
BIshop 2-1374
CICERO
OLympic 2-7740
ALKYDOL Laboratories, Inc.
3230 South 50th Avenue, Cicero 50, Illinois
Eastern Representative:
W. R. Husen Company
125 Woodland Ave., East Orange, N.J.
Telephone: ORange 3-3697
Western Representative:
Pacific Coast Chemicals Co.
2060 Third St., Berkeley 10, Calif.
Telephone: Thornwall 8-1831

Patterson

PROVIDES *The FINEST MILL ··· The FINEST MEDIA*

FOR EVERY QUALITY GRINDING JOB!



Patterson **futura**

PEBBLE MILLS

The great new Patterson FUTURA Mill, with lining and grinding media matched to your production requirements, presents today's maximum value in profit-making grinding performance. FUTURA's new-day features include accurate temperature control at all points—inbuilt motor drive—precision-aligned bearings— 20% greater jacket area —continuous anti-corrosion water treatment—safety guard rail with motor interlock. You'll benefit by getting FUTURA's facts in detail—ask for them, today!

Richard L. Cameron
President

Patterson *POROX*

STANDARD DENSITY

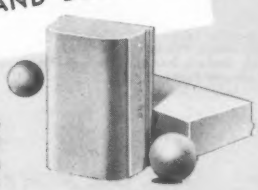
GRINDING BALLS AND BLOCKS

POROX is pure white, even-wearing, economical, dependable—ideal for the widest range of grinding jobs.

Patterson *ARLCITE*

HIGH DENSITY

GRINDING BALLS AND BLOCKS



Longer-lasting, faster-grinding high density linings and balls—first in the field, and first in favor for highest grinding speeds and efficiency. ARLCITE lasts longer over the long run!

The Patterson Foundry and Machine Company

East Liverpool, Ohio, U. S. A.

NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI, ATLANTA, CHICAGO, ST. LOUIS, TULSA, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE

The Patterson Foundry and Machine Company, (Canada) Limited

Toronto, Canada

MONTREAL

Super Market for lacquer

While some manufacturers continue to "shop from store to store" for the best answers to their lacquer problems, others seem to have the right answer before the twinkle in their eye can turn into a frown.

Why the difference? Chances are those who have a "crystal ball" depend on ADM lacquer research. This comprehensive program started in the early thirties with the development of ADM 100 Oil. Since then ADM has worked hand-in-hand with the lacquer industry. A natural result has been the development of a broad line of products which includes lacquer oils, oil type and epoxy plasticizers, non-oxidizing and oxidizing alkyds, and synthetic and natural hard resins.

Although ADM's line of plasticizers and resins includes scores of lacquer-making materials, each possesses distinct characteristics. Some are ideal for broom handle lacquers. Others are unexcelled for specific types of furniture, automotive and water white finishes.

If your lacquer sales aren't what they used to be, better start a modernization program now. The industry's lacquer sales totaled $160,000,000 last year . . . 20% over 1954. The best way to start is to get in touch with your nearest ADM technical sales representative. So pick up the phone and call him or mail the coupon on the opposite page.

Archer-Daniels-Midland

Archer QUALITY

OTHER ADM PRODUCTS: Linseed, Soybean and Marine Oils, Paint Vehicles, Synthetic and Natural Resins, Polyesters, Fatty Acids and Alcohols, Hydrogenated Glycerides, Sperm Oil, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa, Livestock and Poultry Feeds.

Oil Type Plasticizers

The extent of this line, which includes ADM 100, ADM 150, SL 200 and Archer 250, is unique with ADM. Produce higher solids lacquers at spray viscosities than chemical plasticizers. Reduce lacquer costs by permitting use of more plasticizer. Non-volatility imparts *permanent* adhesion, toughness and flexibility to films. Archer 250 and Admex 710, an epoxy, are ideal for water white lacquers and enamels where the ultimate in color retention is required.

Non-Oxidizing Alkyds

Like Aroplaz, characteristics of this group start with "A" and end at "Z". Included are short, medium and long pure non-oxidizing alkyds. Preferred for lacquers having high solids, excellent durability and color retention. Impart great tensile strength to films. Permanent . . . will not sweat out of films. Aroplaz 945, a semi-oxidizing medium oil length alkyd, meets MIL-L-12277 and MIL-L-11195.

manufacturers

Oxidizing Alkyds

A large and complete group including all types of modified and pure oxidizing alkyds. Can be used in varying quantities to improve adhesion to metal. Aroplaz X-663 is unique in that it produces a high solids primer that is non-lifting to lacquer and other recoat formulations containing strong solvents. Aroplaz 1365, a pure medium oil resin, is recommended for MIL-P-7962, corrosion-inhibiting, fast drying lacquer primer.

Synthetic and Natural Hard Resins

If you are looking for an economical way to increase solids, improve adhesion or sanding qualities, impart hardness, you'll find your answer in this group of products. Here you'll find hard resins and solutions such as dewaxed damar, ester gums, modified maleics, and congo esters . . . each with distinct and definite advantages. For example, Arochem 650 produces the finest non-yellowing water white finishes.

FOR COMPLETE INFORMATION

Fill out and mail the coupon today for more information on ADM products for lacquers.

Technical Bulletin No. 76-A is a 40-page, fact-filled Research Report on Lacquer Plasticizers. Data sheets on resins for lacquers will be mailed on request.

ARCHER - DANIELS - MIDLAND COMPANY

Investors Building, Minneapolis 2, Minn.

☐ Send me "Research Report on Lacquers", ADM Technical Bulletin No. 76A.

Send me information on: _____

_____

Name _____

Company _____

Address _____

City _____ Zone ____ State _____

GUN YOUR PAINT PRODUCTION!

. . . For Spray Finishes — Higher Solids at Lower Viscosity . . . Be sure to use

Marbon "9200" ®

Soluble High Styrene Paint Resins

MARBON "9200" L L V resins give your paints excellent sprayability. Higher solids at lower viscosity; controlled dry-rate; high film-build; rapid re-coating; tough and chemically inert films; simple cold-cut manufacture of clear lacquers and high gloss enamels.

MARBON "9200" HV

for low vehicle solids at higher viscosity

MARBON "9200" MV & LV

for general use

MARBON "9200" LLV

for high vehicle solids at lower viscosity

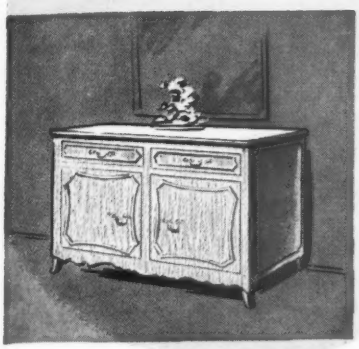
GET THE FACTS — *Write* TODAY FOR TECHNICAL LITERATURE

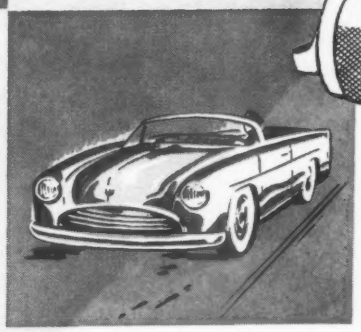
MARBON CHEMICAL

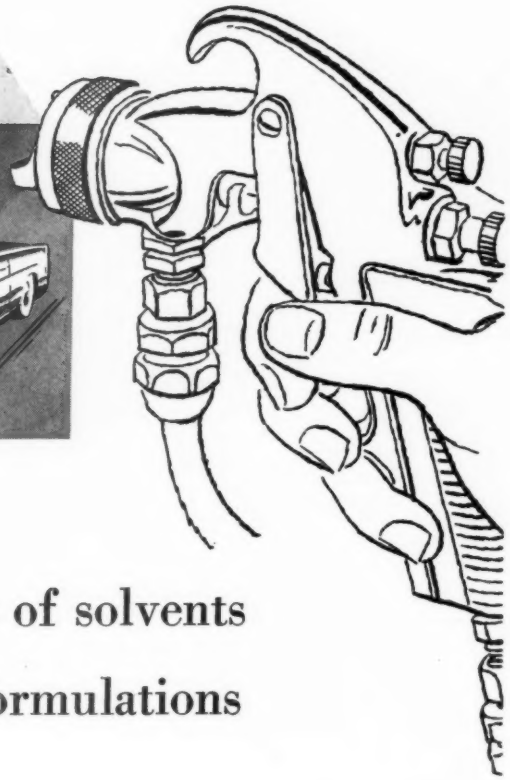
Division of BORG-WARNER

GARY, INDIANA

MARBON . . . Your Buy-Word for Product Perfection







CARBIDE'S complete range of solvents means *flexibility* in formulations

You can select the right solvent or solvent combination from CARBIDE's series of esters, ketones, glycol-ethers, and alcohols.

This range of compounds provides you with a choice of solvent properties—thereby helping you to balance formulation performance and cost.

When you specify—"CARBIDE's Solvents"—you also benefit through—

- fast delivery from the CARBIDE warehouse in your area
- continuous supply from five solvent producing centers—each located near a constant source of raw materials
- "right-size" shipments—with a choice of 55 gal. drums in LCL or carload lots, tank wagons, or tank cars
- plus expert technical counsel

For further information on these solvents, call the CARBIDE office nearest you—or just send in this handy coupon.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal and Toronto

CARBIDE
AND CARBON
CHEMICALS

Carbide and Carbon Chemicals Company
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

CARBIDE AND CARBON CHEMICALS COMPANY, ROOM 308
30 East 42nd Street, New York 17, N. Y.

Please send me the Solvent Selector—a six-page folder presenting the latest data on solvents, plasticizers, couplers and diluents.

Name.....

Company.....

Street.....

City.....Zone.....State.....

I am also interested in more information on.....

business as usual

The point is that he can stay right at his desk and have his office completely painted around him without discomfort. He can when the paint is based on GELVA emulsions. GELVA emulsion polyvinyl acetate paints are odorless, non-toxic, quick drying, and permit easy soap and water cleanup of painting equipment.

Shawinigan has successfully formulated GELVA emulsions for polyvinyl acetate paints since 1944. This unequalled experience combined with continuing research makes Shawinigan a name to remember in today's paint market. For full information write Shawinigan Resins Corporation, Department 2207 Springfield 1, Mass.

GELVA® *emulsions for paints*

SHAWINIGAN RESINS

...SINCLAIR CHEMICALS ALWAYS RIDE FIRST-CLASS!

Two special fleets of tank cars are added assurance that you get what you pay for when you specify Sinclair! To guard against contamination, Sinclair ships odorless solvents and aromatics in separate tank car fleets used exclusively for this purpose. It saves trouble!

TRULY ODORLESS SOLVENTS – Sinclair's team of truly Odorless Solvents, both Light (340-405° F.) and Heavy (375-465° F.), are synthetically produced from carefully selected hydrocarbons to insure the uniformity, stability and superior quality required by manufacturers of odorless paints. Available in full, or split tank car quantities.

HIGH PURITY AROMATICS – Toluol (1° nitration grade), Xylol (5°), and Paraxylene (98%) are being produced by modern Udex extraction facilities at Sinclair's Marcus Hook, Pa., refinery. Available in full, or split tank car quantities.

When your manufacturing processes call for fast and reliable service, and top quality in petroleum-derived chemicals, Sinclair Chemicals, Inc. is ready to serve you. For complete information call or write to:

SINCLAIR CHEMICALS, INC.

(Affiliate of Sinclair Refining Company)

600 Fifth Avenue, New York 20, N. Y. • Phone: Circle 6-3600
155 North Wacker Drive, Chicago 6, Illinois • Phone: Financial 6-5900

Send for the "TECH SERVICE" *man*

In experimenting with ONE, out of the thousands of materials a coatings chemist has to know about, it's a great help to have a *head start.* Spencer Kellogg Technical Service is here to give you that help. These men make it easy for you to know what has come before in this particular kind of application or what has been accomplished in that class of materials.

Spencer Kellogg Technical Service is organized to give you the kind of help or information you want . . . the chemistry of the materials . . . what formulations have been tested . . . what products have been made . . . what is the experience to date . . . how to conduct specific tests . . . opportunity to talk to the men who have done the actual work of testing. Ask for this help. You are most welcome to it.

Ask him about . . .

KELTROL 1001 — KELTROL 1013

These NEW Spencer Kellogg materials are co-polymers of vinyltoluene and vegetable oil. They produce coatings that are outstanding in drying speed and film hardness. A wide range of solvent compatibilities suggest for them many economic and formulating advantages. Among Ketrol products on which data is available are floor and industrial finishes, machine enamels, hammer finishes, traffic paints, label varnishes, primer-sealers and caulking compounds.

The Technical Service Department can give you a "head start" on your own program of evaluating the Keltrols in your field. Write for their bulletins; ask for special suggestions for your own tests.

SPENCER KELLOGG AND SONS INC.
BUFFALO 5, N. Y.

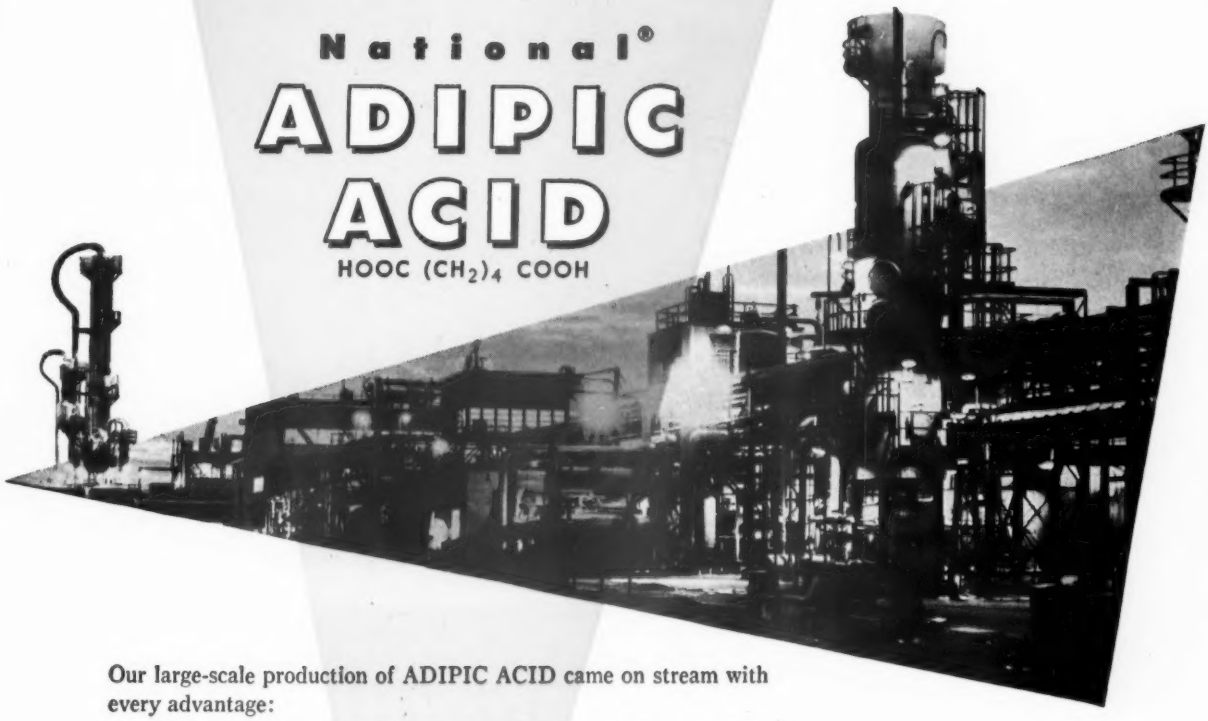
KELLOGG'S THE TEST TELLS 1894

Sets a new high standard of quality

National®

ADIPIC ACID

$HOOC(CH_2)_4COOH$



Our large-scale production of ADIPIC ACID came on stream with every advantage:

A brand new plant Allied Chemical-integrated right back to basic raw materials.

An efficient, continuous process yielding an outstandingly high quality product—99.7% minimum purity, light color and low iron.

If you make or contemplate making adipates, adipic polyesters or polyurethans, you should investigate the advantages of National ADIPIC ACID. It can be used with complete satisfaction in the rubber, plastics, plasticizer, lube oil and chemical industries. We will be glad to send samples, technical data and quotations.

SEND FOR TECHNICAL BULLETIN I-12

This comprehensive 8-page technical bulletin on National Adipic Acid gives physical and chemical properties; principal reactions of the carboxyl and alpha methylene groups; solubility curve, and suggested uses with copious literature references.

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Charlotte Chicago San Francisco Atlanta
Portland, Ore. Greensboro Philadelphia Richmond Cleveland
Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

Santicizer 160 lowers formulating costs of automotive lacquers and contributes extra toughness, hardness, film flexibility, and moisture resistance.

PLASTICIZERS FOR COATINGS?

PHTHALATES • ADIPATES • PHOSPHATES • PHTHALYL GLYCOLATES • SULFONAMIDES • CHLORINATED POLYPHENYLS • SPECIALTIES

PLASTICIZERS FOR:

Nitrocellulose	Cellulose Acetate Butyrate
Polyvinyl Acetate	Shellac
Styrene-butadiene	Zein
Epoxy	Polystyrene Latex
Polyvinyl Chloride	

You Save Time and Money When You Make Monsanto Your Prime Supplier. *Seven* basic plasticizer types—almost fifty different plasticizers—from *one* supplier. You get greater purchasing convenience—and more important, greater purchasing economy. Order mixed shipments of your plasticizer needs in compartmented tank truck or tank car, *at bulk prices.*

Take advantage of Monsanto's Technical Service to help you solve formulating problems, reduce costs, improve finished formulations. Monsanto is one of America's leading suppliers of raw materials for paints and lacquers —and *America's most diversified manufacturer of plasticizers.*

FOR YOUR NITROCELLULOSE LACQUER FORMULATIONS ... TRY THESE PROCESSING SPECIALTIES

Lower Formulating Costs for Metal Lacquers ... Santicizer* 160 (butyl benzyl phthalate) costs less than dibutyl phthalate on either a per-pound or pound-volume basis. Compared to dibutyl phthalate, Santicizer 160 also offers lower volatility, more toughness and hardness in the finished lacquer, and greater oil and moisture resistance.

Flame Resistance for Wood Lacquers ... Santicizer 140 (cresyl diphenyl phosphate) offers

Santicizer 140 contributes flame-resistant properties—with increased solvating action and greater film flexibility at comparable plasticizer levels.

Santolite MHP increases adhesion, imparts greater brilliance, clarity and brightness of colors to nitrocellulose "specialty" lacquers.

STANDARDIZE ON MONSANTO

flame-resistant properties similar to tricresyl phosphate—but contributes greater solvating action. This allows you to reduce your plasticizer requirements. Santicizer 140 also gives your lacquers better low-temperature flexibility and increased light stability.

Better Adhesion, Better Looks for Straw-Hat and Fingernail Lacquers . . . Santolite* MHP (aryl sulfonamide-formaldehyde condensate) increases adhesion of your lacquer formulations, and contributes high resistance to moisture. Lacquers formulated with Santolite MHP also have greater brilliance. The extremely high dye-solubility of Santolite MHP means brighter colors. Important too: Santolite MHP helps you build finished lacquers with more solids content at equivalent viscosities. Your customers will like this feature because they apply more lacquer with fewer coats, at less cost.

For technical information on Monsanto plasticizers — or formulating information — contact your Monsanto representative or write Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, 800 N. 12th Blvd., Dept. PT-4, St. Louis, Missouri.

MONSANTO

Where Creative Chemistry Works Wonders For You

*Reg. U. S. Pat. Off.

This is CONTINENTAL'S new

dedicated to the production of

The product of the handsome building pictured here will be more rapid improvement of cans and packaging methods, for the immediate benefit of Continental customers.

This is the new multi-million-dollar research and development center of Continental's Metal Division, located in Chicago. It brings together under one roof 265 creative-minded scientists and engineers. With as many more technicians and assistants, they function as a closely knit team—in developing better materials, processes and machines—and in taking a fresh, new look at package design.

At their disposal are the most modern chemical, physical and engineering laboratories. Also contained in the 260,000 square feet of the center are complete pilot-plant facilities for checking out any individual proposal against considerations of cost, adaptability to present equipment, and good production practices.

Backing up the new center are other Metal Division laboratories at New York and Hayward, Calif., the Central Research and Development Division facilities in Chicago, which handle long-range experimental work, and 18 field laboratories across the nation.

research and development center

better cans and packaging methods

To our friends in the
PAINT INDUSTRY...
our doors and facilities are always open to you

New developments in paint containers will come from Continental faster than ever, now that our new Metal Division research and development center is working for you. Expect more ideas like our "outside curl" paint can which gives longer life to polyvinyl and latex paints . . . our Perma-Lining for steel containers—hot sprayed and fast baked to cover every inch of inner surface evenly, seams and all.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

Whatever type coating you make, Nuodex has an answer for your anti-skinning requirements. The three Exkins—each developed for a specific field—are tested and proved superior for both interior and exterior coatings.

Performance data show which Exkin will serve you best. Exkin No. 1 is preferred for oil and oleoresinous paints; Exkin No. 2 for alkyd systems. Exkin No. 3 was developed to meet a specific demand in the field of odorless paints. A fine white powder, it is incorporated directly into the letdown and leaves a mild, undetectable odor in the finished paint at normal use levels.

We invite you to take advantage of our wide variety of anti-skinning agents. We are prepared to furnish specifications, working samples and recommended procedure for finding the right Exkin for each of your products.

The Exkins are but three products in a long line of Nuodex Additives—covering every field of paint making. We urge you to call upon the services of our Technical Staff—for cooperative research on either old or new formula problems.

NUODEX ADDITIVES

NUODEX PRODUCTS COMPANY...342 MADISON AVENUE, NEW YORK 17, N. Y.

A Division of Heyden Chemical Corporation

LACQUER for PLASTICS

By
Herman G. Phillips, Jr.*

Many plastic articles require coating to obtain special effects and improved appearance. The coating of molded plastic objects often presents difficulties of softening or etching of the surface by solvents, poor adhesion, or plasticizer migration. This paper describes lacquer formulations which give good performance on difficult-to-coat plastics (e.g., cellulose acetate, polystyrene, the phenolics, and Mylar) when applied by conventional spraying techniques.

THE GROWTH of the plastics industry in the last several years has been phenomenal. In 1946, approximately 1-billion pounds of plastic materials were produced, and it is estimated that production grew to approximately 3 billion pounds in 1955 (1). With this growth, there has been an increased need for special coatings to coat plastic objects used for various applications. The result has been a new field for coatings.

Approximately 20% of the plastic objects manufactured in the United States require some form of coating. Lacquer coatings are the most popular type of coating because of their rapid drying characteristics.

Why Coat Plastics?

Coatings may improve the functional properties, such as exterior durability and abrasion resistance, of some plastics. The primary reasons for coating plastic objects, however, are to obtain special effects, improved appearance, and, in some instances, economy. Some examples are cited below:

1. Plastics are coated to obtain two or more colors in a given object. Plastics can be molded in a variety of single colors, but two or more colors can be more easily and economically obtained by lacquering the molded article.

2. A flat or dull surface is sometimes desired on certain plastic objects. With most plastics, this effect can be obtained by lacquering.

3. It is often more economical to mold products from cheaper plastics and then apply coatings to obtain the colors desired. Dark plastics are usually less expensive than light-colored plastics (which contain more expensive resins and pigments). Special effects obtained in light-colored plastics, such as an opalescent or iridescent appearance, can be obtained more economically by lacquering dark, inexpensive plastics.

Uses of Coated Plastics

Some of the more commonly used plastics which may require coating are:

1. Polystyrene.
2. Cellulose Acetate.
3. Ethyl Cellulose.
4. Phenolics and Other Thermosetting Types.
5. Reinforced Polyester Laminates.
6. Mylar.
7. Acrylics.

Some of the many applications of coated plastic objects are:

1. Toys — Toy Automobiles, Airplanes, Dolls, etc.
2. Fishing Lures.
3. Automobile Parts — Horn Buttons, Emblems, Name Plaques, and Even Automobile Bodies.
4. Refrigerator and Freezer Interiors.
5. Television Cabinets.
6. Advertising Signs.

Formulation Problems

It is probably impossible to formulate a single coating which will give good performance on all types of plastics. Conventional lacquers, used to coat automobiles or furniture, can not be used on most types of plastics. Every type of plastic seems to present a special coating problem. Some of these problems are:

1. *Adhesion*—It is difficult to obtain adhesion to plastics such as the phenolics or Mylar. The type of lacquer vehicle and the type of solvent combination used on such plastics is critical. Correct choice of solvents and modifiers for the film-former is necessary to obtain good adhesion.

The use of mold release agents

*Based on a paper presented by Mr. Philips before the Technical Committee of the National Paint, Varnish, and Lacquer Assoc. at Atlantic City, N.J. Mr. Philips is connected with the Hercules Research Center, Hercules Powder Co., Wilmington, Delaware.

Plastic panel being spray painted.

may also detract from the adhesion of lacquers to many plastics. Silicone or wax-type mold release agents should be avoided wherever possible.

2. *Surface Irregularities*—Defects such as wrinkling, crazing, or frosting can occur on plastics such as cellulose acetate, polystyrene, and the acrylics when they are coated with lacquers which contain poorly designed solvent combinations. The solvent combination of lacquer coatings applied to these plastics is very critical. Lacquer solvent combinations which contain too high a percentage of active solvent for a given plastic may cause surface defects and poor appearance. Fast evaporating active solvents often can be used, however, since they would remain in contact with the surface being coated for a relatively short time.

3. *Plasticizer Migration*—Lacquers applied to highly plasticized materials such as some cellulose acetate plastics can be softened by migration of plasticizer from the plastic into the lacquer film. It is necessary, therefore, to restrict the lacquer vehicle solids to film-formers, resins, and plasticizers which are not softened by the various plasticizers used in a given plastic material.

Specific Lacquer Formulation

Spray application of coatings is the primary method used to coat plastics. The lacquer formulations described in this paper were applied by conventional spraying techniques.

Cellulose Acetate

Cellulose acetate plastic is widely used in the manufacture of dolls. Dolls are often coated with low gloss, highly pigmented lacquers to produce a life-like appearance. Lacquers based on nitrocellulose are not satisfactory for coating highly plasticized cellulose acetate plastics, because they promote migration of the plasticizer. Such films soften and become tacky under conditions of high temperature and humidity (120°F. and 100% R.H.). Shellac behaves in the same manner. Ethyl cellulose lacquers minimize the plasticizer migration problem but have poor adhesion. Cellulose acetate itself seems to be the most suitable film-former for coating various types of cellulose acetate plastic. Several cellulose acetate lacquer formulations which have shown good performance on various grades of cellulose acetate plastic are shown in Table 1.

Ethyl Cellulose

Typical nitrocellulose lacquers are satisfactory on all types of ethyl cellulose plastic except the soft types which contain a relatively high percentage of plasticizer. Lacquers applied to the highly plasticized types should contain lean solvent combinations to avoid softening the plastic. The nitrocellulose lacquer shown in Table 2 is suitable for coating all types of ethyl cellulose plastic including the "soft" types.

	(Parts by Weight)
RS Nitrocellulose, ½-second (dry basis)	6.4
Cellolyn 102	6.4
Hercolyn	6.4
Dibutyl Phthalate	1.9
Methyl Isobutyl Ketone	49.2
V. M. and P. Naphtha	26.3
Ethanol	3.4
	100.0
Total Solids for Spray Application, Per Cent	21
Viscosity, No. 4 Ford Cup, seconds	18

Table 2. Lacquer for ethyl cellulose plastics.

Polystyrene

A variety of inexpensive toys is now made from polystyrene plastic Many of these toys are lacquered in several colors. Polystyrene is

	Parts by Weight 1	2
Solids Content		
Cellulose Acetate LL-1	83	50
Santicizer M-17	17	20
Durez 500	—	30
Solvent Combination		
Acetone	40	40
Ethanol	6	6
1-Nitropropane	17	17
Methyl Cellosolve Acetate	17	17
Toluene[a]	20	20
Total Solids, Per Cent	15	15
Viscosity, No. 4 Ford Cup, seconds	18	23

a Dilution with toluene should be done slowly with agitation after solids are dissolved in active solvents.

Table 1. Lacquer for cellulose acetate plastic.

readily attacked by ester, ketone, and aromatic hydrocarbon solvents. It is necessary, therefore, to use a minimum of such active solvents in the solvent combinations for coatings applied to polystyrene. Ethyl cellulose and the SS-type nitrocellulose, which are soluble in various alcohols, are logical film-formers for coating polystyrene plastic.

The ethyl cellulose lacquer shown in Table 3 gives good adhesion to polystyrene. Polystyrene solvents have been included to obtain adhesion but they must be kept to a minimum in order to avoid softening or etching the plastic.

	Parts by Weight
Solids Content	
Ethyl Cellulose N-10	45
Cellolyn 102	45
Tricresyl Phosphate	10
	100
Solvent Combination	
Ethanol	30
n-Butanol	20
Cellosolve	10
Butyl Cellosolve	12
Butyl Acetate	13
Toluene	15
	100
Suggested Solids for Spraying Viscosity, Per Cent	16

Table 3. Lacquer for polystyrene plastics.

Phenolics

The lacquer solvent combination aids in promoting adhesion to various thermoplastic materials by actually softening the plastic. In the case of the thermosetting plastics which are insoluble in organic solvents, adhesion must be obtained from the lacquer vehicle solids. The inclusion of phenolic resins as modifiers in nitrocellulose lacquers gives vehicles which have good adhesion to many phenolic plastics.

An example of a lacquer which has shown good adhesion to molded phenolic television cabinets is shown in Table 4.

Polyesters

A conventional automotive lacquer finishing system for metal gives good results when applied to reinforced polyester plastics such as those used for plastic automobile bodies. Such substrates are rough and tend to promote adhesion of the lacquer. A nitrocellulose lacquer primer which meet Military Specification MIL-P-11414A, followed by a conventional automotive lacquer topcoat, gives good performance on these polyester substrates.

	Parts by Weight
Solids Content	
RS Nitrocellulose, ½-sec.	32
Super Beckacite No. 1001	32
Dioctyl Phthalate	8
Baker's Pale No. 16 Oil	8
Titanium Dioxide (Rutile Type)	20
	100
Solvent Combination	
Butyl Acetate	35
Ethanol	15
Toluene	50
	100
Total Solids for Spray Application, Per Cent	23
Viscosity, No. 4 Ford Cup, seconds	25

Table 4. Lacquer for phenolic plastic television cabinets.

On smooth, unfilled polyester substrates, such as Mylar film, conventional lacquers or inks have poor adhesion. Nitrocellulose lacquers modified with hydroabietyl alcohol (Abitol) and dihydroabietyl phthalate (Synthetics B-21) have excellent adhesion to Mylar film.

Acrylics

Acrylic plastics, in particular polymethyl methacrylate, are used extensively for automotive ornaments for interior or exterior trim. These ornaments are often lacquered to improve their appearance, as to conform with a color scheme. Conventional lacquers, modified to contain a minimum of solvents which would affect acrylic plastics, show good performance. Table 5 includes suitable formulations for application to acrylic plastics (2).

(2) U.S. Patent 2,684,310 includes other formulations for application to polymethyl methacrylate plastics.

Metallized Plastics

Transparent polystyrene, cellulose acetate, and methyl methacrylate plastics are often "metallized" to obtain special effects. The plastics are sometimes coated with colored lacquers before the metallizing operation, in order to give a colored metallic effect when the object is viewed from the opposite side. Lacquers, such as described previously for specific plastics, are suitable for this purpose. After metallizing, a thin coat of a clear lacquer may be applied to protect the appearance of the

(*Turn to page 92*)

Toy trailways busses are molded with high-impact styrene; also in butyrate and cellulose acetate. These busses are molded in white material and then are sprayed with a lacquer to obtain certain colored effects as desired.

VAPOR DISPOSAL UNIT

New device is said to control pollutants in varnish cooking operations.

SINCE the advent of smog in the Southern California basin, millions of dollars have been spent on research into the causes and possible remedies of the strange phenomenon. The general public has singled out industry as being more responsible for smog than any other single element in the community, and the efforts of progressive industrial executives to avoid the stigma of being branded as a smog violater has led to a search for better and more economical devices to control air pollution.

One of the most frequently-cited industries in the battle against smog has been the varnish industry. When varnish is cooked, considerable basic constituents break into lower hydrocarbon molecules that cause irritation to eyes and nose. By waterwashing the fumes, 90 per cent of the irritants have been removed—but the remaining 10 per cent has created a neighborhood nuisance.

To eliminate this nuisance and to allow the varnish industry to meet requirements of the *Air Pollution Control District*, *Hirt Combustion Engineers*, a Los Angeles engineering firm, designed a vapor disposal unit especially constructed for disposing of varnish vapors. The Air Pollution District has ruled that all fumes of a combustible nature must be eliminated from the atmosphere.

The Hirt Combustion Engineers developed their unit to operate with a minimum of operating capital. This was important, because although smog control is considered by most industrialists as a necessity, it is also non-productive capital.

Prior methods of disposing of varnish vapors usually consisted of a blower sucking off the fumes and pushing them through an incinerator. Although this system is generally satisfactory, it was decided that the cost of blower maintenance due to vapor condensation was excessive. The nuisance of cleaning the blower also should be eliminated.

The Hirt vapor disposal unit uses a system which sucks fumes through a disposal incinerator and then uses the blower to dispose the remains after incineration. The unit has five basic components. In addition to the blower, motor and exhaust stack, the unit utilizes a special hood collection system and a specially-designed incinerator.

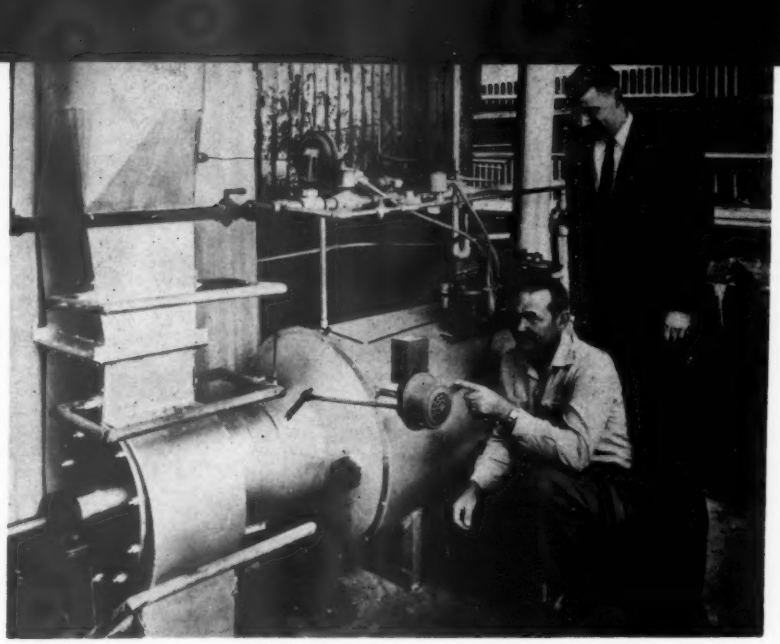
Completed pickup of varnish fumes is noted while kettle is in operation.

The hood collection system takes up all fumes without taking in an excess of air so that fumes become diluted without becoming too air saturated to be incinerated. The incinerator is carefully designed to incinerate all products with minimum combustion volume. To assure a mimimum amount of excess fuel, the unit has an automatic throttling control. The blower has a high temperature alloy impeller that resists the heat. For economy, the remainder of the blower is not insulated, as insulation is not necessarily due to the fact that the blower gases have been completely incinerated. This permits a very inexpensive design, compared to blowers in conventional systems.

For utmost safety, special controls have been incorporated into the unit. The damper is designed so that it will open or close completely, with no possibility of being half open. This eliminates flashback that occurs when fumes travel too slowly from the hood through the ducts to the incinerator. Other safety controls shut off main burner if fire goes out, temperature becomes excessive or the blower stops, and notifies the operator immediately if the incinerator is not working normally.

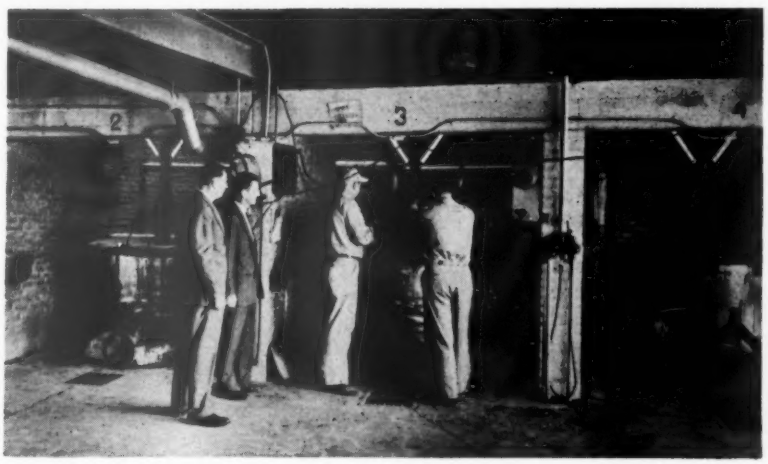
The operating economies have been satisfactory. The system has been carefully balanced so that at maximum vapor production the main burner is automatically throttled down to almost a pilot burner so that only during the early heat up stages is full fuel input required. In no plant installation has there been any major increase in plant fuel costs.

In addition to the varnish making industry, this system is suitable for use in paint-making and lithography industries.



Howler and temperature limit are added as additional safety features on this vapor disposal unit. This unit replaced the water wash system after the neighbors complained of fumes. Fumes were eliminated and maintenance and disposal expense greatly reduced.

Operators report considerable decrease in lung irritation when fumes are removed from the varnish plants. Here a cooker stirs operating kettle after adding new ingredients. Although both kettles are producing white fumes, all fumes are collected for incineration.



Lack of fumes are noted although workmen are adding solids. Kettle #1 (not shown in photo) is inoperative and hood duct is shut off to conserve heat while hoods 2, 3, and 4 are in various stages of the cooking cycle. This installation uses an electronic type of combustion safeguard. To conserve yard space, the vapor incinerator is installed beyond #3 parapat wall and the fan beyond #4 parapat wall.

EPOXIDATION and USES of EPOXIDES in COATINGS

Part IV—Epoxy Resins, Reactions and Uses of Epoxides

By
Dr. Daniel Swern*

Part IV, the concluding part of this series of articles, is concerned with the preparation, chemistry, and various uses of epoxy resins. An important phase of this discussion is a section dealing with the reaction of epoxides which appear to be of potential interest to surface coatings and related industries.

Part I, II, and III appeared in the April, May and June issues respectively.

THE versatile epoxy resins were first manufactured in the United States about 1947. There is now sufficient capacity to manufacture over 30 million pounds per year.

are the reaction products of polyphenolic compounds, notably bisphenol-A, and an epoxy compound, principally epichlorohydrin, as shown in Figure 1.

In a general way, the outstanding properties of the epoxy resins may be correlated with their chemical structure. It will be noted that the only chain linkage other than carbon to carbon in this linear polymer is the ether linkage. The chemical resistance of this bond in contrast with an ester linkage is extremely good. The reactive hydroxyl and epoxide groups are widely spaced along the chain so that the curing agents which cross link the resin and make it thermosetting are sufficiently far apart to give rise to the

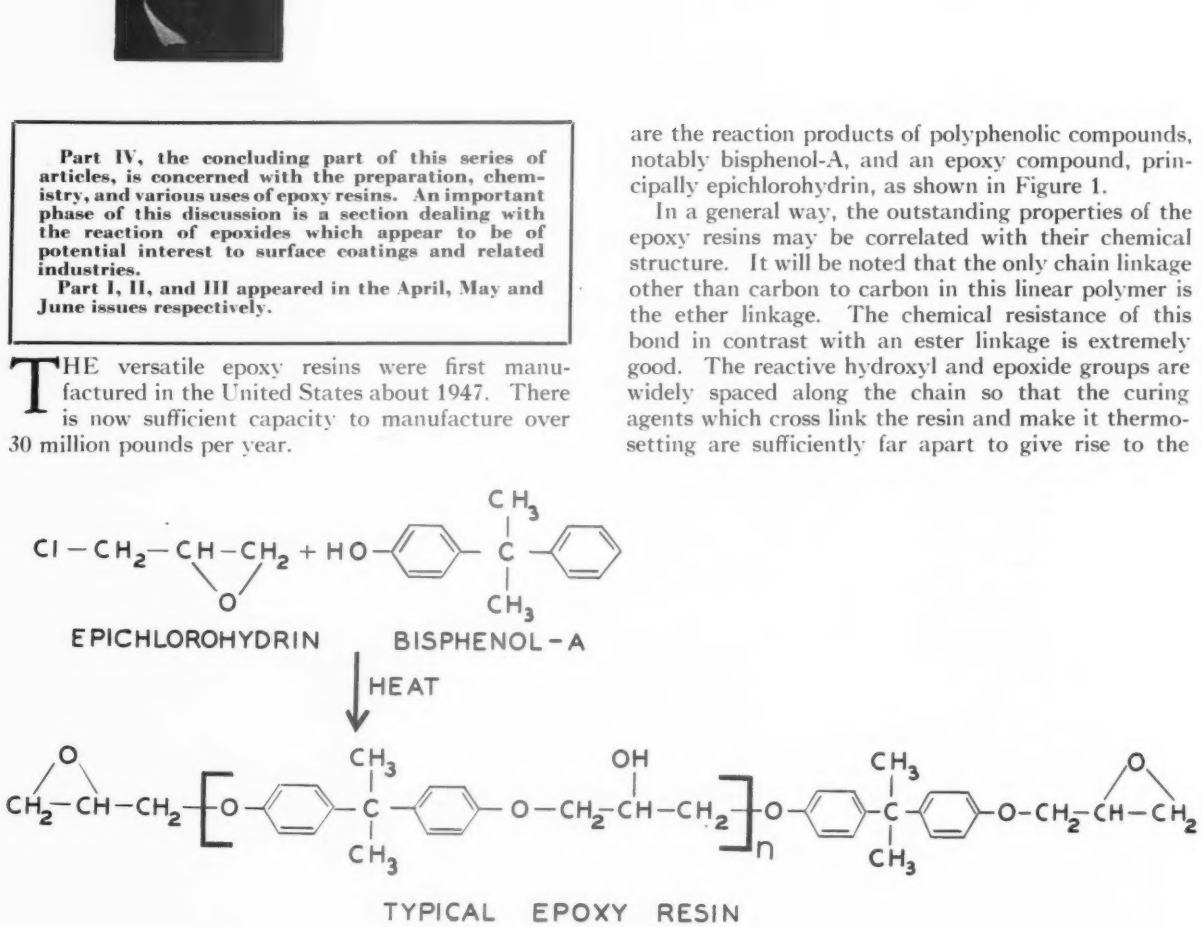


Figure 1

The epoxy resins are based on one of several epoxy compounds. The most familiar and most important unusual flexibility exhibited by the cured resin. The polar nature of the molecule makes possible the outstanding adhesion. The phenolic hydroxyl group which often is a source of poor color in polymers is

*Dr. Swern is connected with the Eastern Regiona Research Laboratory, United States Department of Agriculture, Philadelphia, Pa.

etherified and, therefore, epoxy resins exhibit generally good color and color retention.

Epoxy resins owe their rapid rise and wide versatility to the following characteristics:

a) Wetting and adhesion to a wide variety of different types of surfaces due to the presence of both hydrocarbon and polar centers in the molecule.

b) Curing without evolution of by-products, permitting the manufacture of relatively bubble-free castings of all sizes.

c) Very low volume shrinkage, due to the highly associated nature of the uncured resin, which minimizes shrinkage strains set up during curing.

d) Resistance to many acids, most alkalies and solvents due to presence of highly stable ether linkages.

e) High mechanical strength.

f) Good thermal stability.

g) Outstanding electrical properties at both room and elevated temperatures.

h) Exceptional water resistance.

i) Practically completely resistant to fungi.

j) Easy curing, with no need for special conditions or precise temperatures.

Commercially available epoxy resins range from low viscosity liquids to high melting solids (150° C). Molecular weights vary from about 300 to about 4000. Epoxy values range from about 0.15-4.25 equivalents of epoxide per kilogram of resin. In general, coatings are usually based on resins with values from 0.20-0.25 whereas casting resins utilize epoxy values above about 2.25.

The unmodified epoxy resins can be made to react with heat-convertible resins, they can be cured with a variety of hardening agents notably of the amine and acid type, and they can be esterified with fatty acids to produce varnish-type vehicles. The cured resins exhibit an unusual balance of properties which include good flexibility, adhesion and chemical resistance, low shrinkage, and good electrical and physical properties.

Epoxy and Heat Convertible Combinations

Epoxy resins may be dissolved in a suitable solvent and blended with heat reactive resins, such as phenol-formaldehyde or urea-formaldehyde. These blends form the basis of epoxy resin baking enamels and clears. Films of these blends when baked produce a three-dimensional polymer as the heat reactive resin cross links with the reactive groups in the epoxy resin. The result is a hard, adherent, flexible coating in which the chemical resistance is unimpaired by the presence of ester linkages, such as occur in alkyd or oleoresinous systems.

Curing Epoxy Resins

Amines: Epoxy resins can be effectively cured at room temperature by reaction with small amounts of certain amines, such as ethylene diamine, diethylene triamine, triethylene tetramine or tetraethylene pentamine. These systems have pot lives (working time after hardener has been added) ranging from 15 minutes to 60 hours.

The hardener, a liquid of low viscosity, is added to the epoxy resin just prior to use. As the hardener is added, the mixture may start to warm up and then thicken as the gel state is approached. This type of system permits the coating of items which must withstand strong solvents and corrosive atmospheres and yet cannot be baked. For the first time a finish is available which combines the properties of a baked film with convenience of an air-dry coating. Since these finishes cure without oxidation, heavy coats can be applied in one operation. In some formulations, the use of a flow control agent, such as urea resin, has been found beneficial in producing finishes of high gloss, free from surface imperfections.

Because of the essentially colorless cured films produced by this coating, a wide variety of colors as well as clears are available to the formulator. Corrosion resistant finishes in white, ivory and pastels, as well as deep colors can be easily obtained.

The major limitation, typical of epoxy resin-room temperature curing, is that the heat distortion point does not exceed 180-200° F.

Acid Anhydrides: Acid cured systems, using materials such as phthalic anhydride or maleic anhydride generally require "hot melt" conditions because precipitation of the anhydride occurs below 60° C. Since this elevated temperature is required, the advantages of a higher molecular weight resin with a melting point higher than 60° C can be realized. The viscosities and pot lives of these systems at the handling temperatures are most satisfactory. Further, these systems are not hampered by high exotherms, exhibit excellent thermal stability, and have higher heat distortion points in addition to the usual epoxy characteristics. Cured products may exhibit heat distortion points of about 110° C in addition to excellent thermal stability.

The two systems (amine and anhydride curing) just described briefly illustrate the epoxy resin hardener types in widest use today. Although each system has certain disadvantages, both have helped fill the wide gaps that exist in the resin field. Many variations are available. Diluents, plasticizers, solvents, fillers, pigments, dyes, etc., are employed to modify these systems. Further changes may be made by varying the epoxy resin and the amine or acid anhydride.

Newer Curing Agents: Endeavors by epoxy resin producers to overcome the limitations imposed by current types have resulted in newer resins and hardeners. Today, we have high heat distortion point systems; liquid acid hardeners permitting room temperature handling; resilient, internally plasticized materials; short cure-time materials with long pot lives; and others.

Solid Aromatic Amines: Early in 1954, a new hardener for epoxides came on the market. This material is metaphenylene diamine (MPDA), and is a solid aromatic amine which yields heat distortion points of about 150° C. MPDA is generally used with liquid epoxies in quantities of about 15% by weight of the resin being employed. The mixture can then be cast or used in the manufacture of glass laminates. Another important advantage offered by this system is the gel stage through which it passes in the process of curing. This permits "dry lay-up" techniques in laminating and two-stage casting. This latter tech-

nique permits the minimizing of the high exothermic temperatures developed in large castings. Despite certain disadvantages, the MPDA system offers what has heretofore been impossible in an amine system namely, high heat distortion points and gel-stage handling.

Liquid Acid Anhydrides: The next system to overcome the disadvantages of the early acid-cured types was attempted, and resulted into a liquid acid hardener which when combined with a liquid epoxy resin possessed the following five characteristics:

a) Low initial viscosity.
b) Long pot life.
c) Relatively high heat distortion point after curing (220° F).
d) Ability to cure readily at 150-200° F.
e) Excellent physical and electrical properties.

This system also permits the use of an accelerator or promotor which speeds up the curing from 8 hours at 300° F to as little as 50 minutes at only 150° F. It has found wide use in laminating, tooling and casting.

Complex Anhydrides: The latest hardening material to make its appearance is hexachloroendomethylene tetrahydrophthalic anhydride (HET). This material is a dicarboxylic anhydride similar to phthalic anhydride, but offers several advantages over the latter because of higher heat distortion points (as high as 187° C), faster curing, greater hardness and is self-extinguishing. HET is handled very similarly to phthalic anhydride; the hardener is dissolved in the heated resin at about 120° C with vigorous stirring. A liquid epoxy resin is generally employed with equal parts by weight of HET. The resulting mixture exhibits a low viscosity and a pot life of about 30 minutes.

Polysulfides: The cured products previously described yield relatively hard cured materials. It is possible to obtain resilient products by curing with relatively long chain hardeners. One such cross linking type is the polysulfide rubbers. Several of these liquid polymers are available which vary in viscosity, molecular weight and degree of cross linking. They are employed, in conjunction with liquid amines, in amounts up to 200% of the weight of epoxy resin.

Polyamides: Another useful curing system uses liquid and semi-liquid polyamide resins. The epoxy resin and polyamide resin are generally blended by adding the warmed polyamide (50-60° C) to the relatively fluid epoxy. Further reduction in viscosity can be achieved by slightly heating the mixture, resulting in shortened pot life. Curing is accomplished at elevated temperatures (20 minutes at 300° F with batch quantities less than 6-8 pounds). The cured products offer high impact resistance, outstanding adhesion, high di-electric strength, and excellent resistance to water and solvents.

The polyamides are employed in quantities from 40-100% of the weight of epoxy resin. Increasing proportions of polyamides yield products of higher impact strength and resiliency.

Esterification Reactions

The reactive epoxy and hydroxyl groups of epoxy resins will esterify with organic acids under the influence of heat. This reaction is of particular value when the acid is a long chain fatty acid, such as soybean, linseed or coconut fatty acid. The reaction product is similar to conventional alkyd resins of similar oil type, with the exception that the inherent superiority of the epoxy resins over glycerol-phthalate as the polyol carries over into the properties of the epoxy resin-fatty acid esters. By suitable choice of amount and type of fatty acid, a wide range of epoxy resin-fatty acid esters is available for a variety of uses. Medium or medium-long linseed esters produce outstanding spar type varnishes. Short oil dehydrated castor or soybean fatty acid esters provide the basis of melamine-modified baking enamels with superior chemical resistance.

The choice of epoxy resin is dictated by consideration of film properties and also by vehicle properties such as viscosity and acid number. As epoxy resins of increasing molecular weight are used, the ester viscosity increases and the acid number at any given time is higher. A widely used epoxy ester for this purpose is one which has a melting point about 100° C, a Gardner viscosity of Q-U and about 1 epoxide equivalent per kilogram of resin. Such an epoxy resin gives vehicles of sufficient viscosity and low acid number at conveniently short cooking schedules.

Although any acid will react to form esters with epoxy resins, those of major importance are fatty acids, rosin and rosin acids, tall oil acids or mixtures of these acids with limited amounts of aromatic acids or polybasic acids. By proper selection of type and amount of acid, a range of esters may be made which include long, medium, and short oil types with drying, semi-drying or non-drying characteristics. The type of acid used is governed by the same considerations as in the selection of acids for alkyd manufacture. The effect of oil length is similar. With increasing oil modification, solubility, application solids, brushing ease, flow, sagging, and grinding ease increase, whereas viscosity, hardness, initial gloss and color retention decrease. Drying speed and exterior durability reaches a maximum at medium-length depending upon type of acid.

Preparation of Esters

The technique of preparing epoxy resin-fatty acid esters is generally adaptable to open kettle operation or closed kettle operation. Open kettle cook usually results in slightly higher viscosity and darker esters even with good agitation and when the kettle is well sparged and blanketed with an inert gas. Closed kettle cooks may be made either by the azeotropic method in which a small amount of hydrocarbon solvent is introduced to aid in water removal, or by the fusion method in which temperature, agitation and inert gas alone are used to expel water. The major differences in esters produced by these two methods of closed-kettle operation have been a slightly increased viscosity and speed of dry for the fusion-cooked esters, compared to slightly better color and faster cooking for the azeotropically-formed esters.

In addition to the above types of esters, epoxy resins react with rosin to form hard solids somewhat similar

to, but tougher, harder and faster bodying than ester gum. This rosinate may be cooked with oils to form oleoresinous varnishes possessing excellent hardness and toughness.

A third type of ester which can be formed with epoxy resins consists of styrenated epoxy esters. The cooking procedure for these esters is slightly different in that after the fatty acid esterification has been partially completed, monomeric styrene and catalyst, such as di-tertiary butyl peroxide, are slowly added to a reduced solution of the ester and refluxed. Although somewhat analogous to styrenated alkyds, these styrenated epoxy resin esters have shown far superior outdoor durability, improved mar resistance and improved chemical and solvent resistance. They can be used in off-whites and all colors for baking enamels, shell casing enamels, force dry wool finishes, quick drying enamels and clear varnishes.

Uses of Epoxy Resins

Surface Coatings: Although the use of epoxy resins has grown rapidly in noncoating applications, the major portion of the resin produced goes into the protective coating industry. Epoxy resins are widely used in protective coatings for appliances, plant structure and equipment, cans and drums, gym floors, and a host of other hard-to-protect surfaces.

Paints, varnishes and enamels formulated from epoxy resins have improved the durability and have increased the corrosion resistance of a variety of finishes. They were used at an early stage of their development for optimum resistance to alkalies and detergents on automatic washing machines. Their chemical resistance has provided them a ready entree into the drum, tank, and tankcar lining fields, where they are widely used in combination with phenolic resins. These linings will resist a broad range of chemicals and have increased the versatility of the containers they protect. A line of domestic and industrial evaporative coolers uses an epoxy coating to eliminate the corrosion caused by constant contact of the cooler parts with water. Metal furniture used both indoors and outdoors in hot, dry climates or in areas of high humidity and salt air is protected by epoxy resin finishes.

The use of epoxy-containing finishes is helping a growing number of companies to lower maintenance costs since they substantially reduce the frequency of repainting and increase the degree of protection. Dairies, off-shore drilling rigs, and DDT plants are outstanding examples of spots where the chemical resistance of the resins has been used to good advantage.

Potting and Casting: The rigid requirements recently being specified for electronic and electrical equipment have necessitated embedment, encapsulation and potting in many cases. Epoxy resins are being used for the embedment of units ranging in size from transistors, capacitors, precision resistors, television components, servo, synchro and gyro motors, delay lines, to instrument transformers 12 feet high contained in 2,200 pounds of resin. Many of these forward strides have been due to the development of the new curing agents.

Another phase of casting is the use of epoxy resin draw and forming dies for sheet metal working on a production basis. The excellent dimensional stability, adhesion, impact resistance, and toughness are the properties that warrant this use. Draw dies have been constructed not only for prototype work but also for production forming of automotive parts. Certain of these dies have performed in excess of 60,000 times without need of repair. It appears that epoxy resin dies and die components may replace metal ones to obtain lower initial cost and lower maintenance cost, making frequent style changes less expensive.

Laminates: The same epoxy systems that are finding use in potting and casting applications have been adapted for the manufacture of plastic laminates. The usual reinforcing agent is glass fiber. These are now being used on a commercial basis in the production of printed circuits, laminated tools and jigs, ducts, liquid storage tanks, and a variety of other applications.

By using epoxy resins, a copper glass-fiber laminate can be made in one pressing, since the resin exhibits good adhesion to copper. The laminate has good electrical properties, is easily machined, and is unusually resistant to the etching solutions used during the removal of unwanted copper in the production of printed circuits.

Laminates can now be readily prepared that have ultimate flexural strengths as high as 75,000 p.s.i., dropping only to 57,000 p.s.i. at 300° F, and that retain 47,000 p.s.i. after 300 hours at 400° F. Even after boiling in acetone, the flexural strength may be as high as 82,000 p.s.i., and after 3 hours in boiling water as high as 76,000 p.s.i. They have retained their physical characteristics almost intact after 90 days' immersion in 70% and 3% sulfuric acid, 10% hydrochloric acid, glacial acetic acid, 50% and 1% sodium hydroxide, acetone, ethylene dichloride, methyl carbitol, jet fuel, high octane gasoline and a number of other chemicals. Compressive strength at room temperature is as high as 59,000 p.s.i.

Adhesives: Epoxy resins have long been used in the formulation of adhesives for bonding metal, glass, ceramics, plastics, rubber and wood. Although they can be cured at room temperature, optimum properties are generally developed when the resins are cured at higher temperatures. They are currently being used in aircraft construction for a number of applications. Sandwich-type radar transmission screens in which aluminum honeycomb is used in one outlet, and another application is in the construction of wing flaps. Adhesives can be applied by brushing, rolling, spraying and dipping. Curing time and temperature depend on the type of adhesive used, but will range from 350° F for 15 minutes to room temperature for 4 hours. Tensile shear strength of 3200 p.s.i. can be obtained at room temperature; shear strength at 180° F may be as high as 3100 p.s.i. and at 250° F 1200 p.s.i. Bonds exhibit good strength even at low temperatures, having a tensile shear of 2600 p.s.i. at −70° F. After 200 hours at 180° F, the tensile strength is 2200 p.s.i. The bonds are resistant to a large number of chemicals, comparable to castings and laminates.

Stabilizers: Epoxy resins also find use as stabilizers for polyvinyl chloride and certain other chlorinated

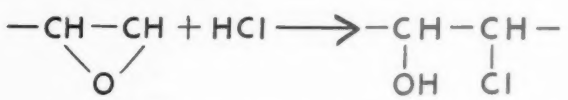
polymers. The epoxide ring in the resins readily absorbs the hydrogen chloride given off during the degradation of the polymer. The epoxy resin stabilizers are generally used with barium and cadmium salts, but may be used alone where nontoxic properties are required.

Tooling: Low viscosity epoxy resins, incorporating both metallic and mineral fillers, are used with various hardeners to produce a wide variety of dimensionally stable tools. These tools are now being employed in various metal forming, fabricating and assembling operations. They are also used as vacuum forming molds and low pressure molding dies.

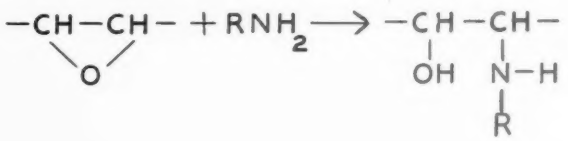
In summary, the future of epoxy resins looks bright because of their versatility and generally outstanding characteristics. One barrier to rapid growth is their relatively high price but if this should fall significantly their use will skyrocket.

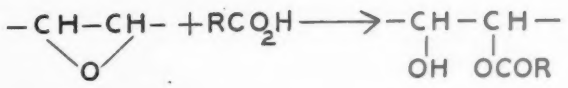
Reaction of Epoxides

As we have already seen, the epoxide group is an extremely reactive one. Its reaction with hydrogen chloride is the basis for the use of epoxides as stabilizers for polyvinyl chloride.



The reaction of epoxides with amines and acids is used in the curing of epoxy resins as discussed in Part III (June, 1956).





With polyfunctional epoxides, such as the epoxy resins, molecular weight increase and cross-linking occur when polyfunctional amines or acids are used.

Other reactions of epoxides which are of interest are tabulated below:

REAGENT	PRODUCT
Water(H_2O)	$-CH(OH)-CH(OH)-$
Hydrogen cyanide	$-CH(OH)-CH(CN)-$
Ammonia(NH_3)	$-CH(OH)-CH(NH_2)-$
Phosphorus Pentachloride	$-CH=CH-CH(Cl)-$
Thionyl chloride	$(-CH(Cl)-CH)_2SO_3$
Sodium sulfite	$-CH(OH)-CH(SO_3Na)-$
Acetylene	$-CH(OH)-CH(C\equiv CH)-$
Pyrolysis	$-CH=CH-CH=CH-$
Acid chloride	$-CH(Cl)-CH(OCOR)-$
Hydrogen sulfide	$-CH(OH)-CH(SH)-$
Benzene	$-CH(OH)-CH(C_6H_5)-$
Alcohols	$-CH(OH)-CH(OR)-$
Phenols	$-CH(OH)-CH(OC_6H_5)-$
Mercaptans	$-CH(OH)-CH(SR)-$

It should be noted that the epoxide ring undergoes reaction with a variety of reagents, and the products obtained are also reactive because of the functional groups they contain.

General Uses

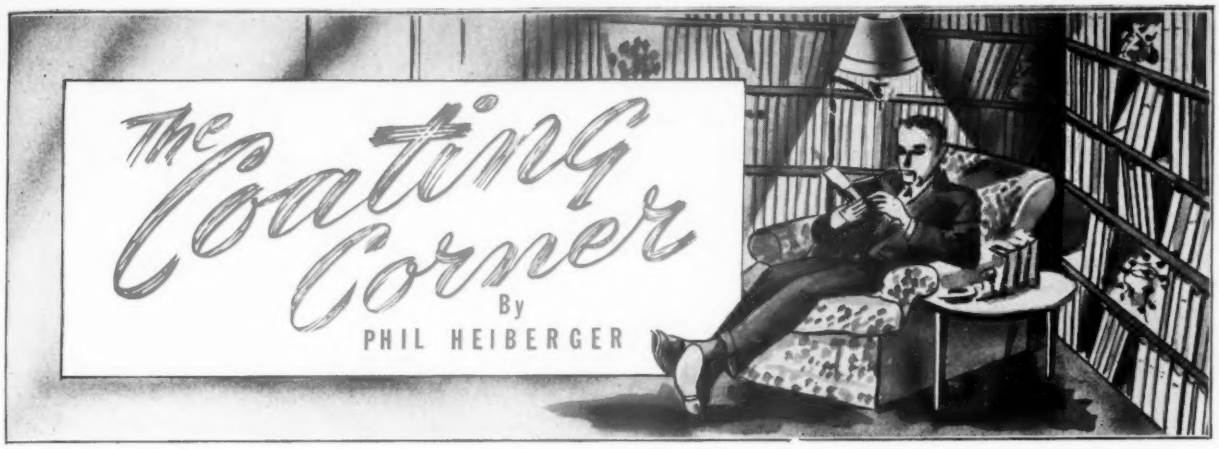
Epoxides have found uses in a number of ways, some of which are discussed below.

Plasticizers: Epoxidized esters of oleic and linoleic acids, soybean and linseed oil are used for this purpose, as has already been discussed.

Stabilizers: Epoxidized vegetable oils are stabilizers for chlorinated rubber, polyvinyl chloride and other polymers which yield an acid decomposition product. Glycidyl ethers of dihydric phenols also stabilize polyvinyl chloride. A stabilized grade of chlorinated rubber, containing an epoxy type stabilizer, has been introduced for use in paints.

Synthetic Drying Compositions: Tall oil esters of high molecular weight polymeric polyhydric alcohols containing polyepoxides are claimed to be useful as drying

(*Turn to page 96*)



Printed words, for me, hold a magnetic attraction. So there's nothing surprising about my long-standing hobby of wide reading. Delving into various branches of science and industry and occasionally escaping into the exciting world of science-fiction—that's my idea of fun.

What is surprising, though, is the frequency with which I run across (often in the most unlikely places) news items, odd facts, intriguing ideas, novel attitudes, revolutionary concepts, and practical techniques which, with a slight twist of the imagination, seem to have real bearing on my main business in life—the paint industry.

The thought occurred that perhaps other paint-minded readers might share my interest in some of these items. So, with the help and encouragement of Editor Tony Errico, the idea for this new monthly column was born. The idea, in essence, is to string together each month a few of the more pertinent passages that have caught my attention, along with their sources and a bit of personal comment, for the light or serious consideration of the readers of this magazine.

Some items will be obviously applicable to the paint field. Others will be only remotely applicable. Some may be good for nothing more than a laugh or a frown. But a few, I hope, may have positive potential value for those of us immersed in paint problems and striving for paint progress.

We all know that every day methods, techniques, and concepts developed in one field of endeavor—and facts that have emerged from one field of research—are profitably adapted by imaginative workers in neighboring fields. We also know that too often valuable knowledge from one field of learning is lost to workers in related fields because of necessary specialization and regrettable lack of communication. To minimize, even to a small degree, such losses is the raison d'etre of this column.

A secondary reason might be this: It would give me pleasure to have you join me in an occasional chuckle. That is, of course, if your funny bone is constructed anything like mine.

It should be stated clearly at the outset that the opinions expressed here will be mine and mine alone and will in no way reflect those of either this publication or the National Lead Company, my employer.

Readers' comments and suggestions are invited.

"Painting Water"

TIME was when the term "water paint" could mean only one thing: a paint containing water. Today, however, the shoe is on the other foot, and "water paint" can also mean a paint that is applied to water. Does this sound sensible? Let me clarify.

The purpose of this new kind of "water paint" is to conserve short water supplies in hot, dry areas (such as Australia and Texas) by reducing evaporation. Lakes, ponds, and reservoirs can be "painted."

Far from a joke, this has actually been done experimentally by Australian scientist W. W. Mansfield, of the Commonwealth Scientific and Industrial Organization, according to the Dallas Morning News of April 11.

Basically, the method is to float a waxy alcohol, such as hexadecanol, in a reservoir or farm pool to form a monomolecular film on the water surface. Believe it or not, this thin invisible film cuts down evaporation on the average of 45%. The treatment is immune to the ravages of dust, wind, and rain since the hexadecanol resupplies itself.

Phil Heiberger

This application stands to become important economically in areas (the Southwest, for example) where climactic conditions are similar to those of Australia—low rainfall and high evaporation rates. Mansfield states that in one Australian town the average rainfall is 5.5 inches per year while the average evaporation is 8 feet per year.

The experiments in Australia extended from one-acre ponds to 2000-acre reservoirs. A cost of $7 is estimated for each acre-foot of water saved. On the basis of his experience in Australia, Mansfield is helping the Southwest Research Institute in San Antonio launch an 18 month survey of the evaporation problem.

Dr. Louis Koenig, vice president of the Southwest Research Insti-

tute, estimates a loss of 7.5 million acre-feet of water each year in Texas alone.

Long straight chain fatty derivatives are the components one normally turns to in any classic study of film formers. At the moment it might be difficult to name a more suitable class of compounds for this application, but no doubt a product more nearly fitting the description of a protective coating will eventually be found.

So breathes there the enterprising paint manufacturer whose rigid, flexible, dense, porous, metallic, or non-metallic specialties markets have been exhausted, he can have the satisfaction of knowing that there are still new worlds waiting to be conquered.

The Awful Truth

TO start illogically by taking second things first, let's consider for a moment this matter of a funny bone.

For many years there's been a running argument as to whether the British do or do not have a sense of humor. Noel Coward, noted British author-composer-actor, recently added coals to the fire by stoutly refuting (in a magazine article) the canard that they do not. Having successfully tickled millions of funny bones on both sides of the Atlantic for decades, he speaks with authority. We must believe him.

What, then, are we to make of the following excerpt from an anonymous book review in the April 1956 issue of the Journal of Oil and Colour Chemists' Association?

"Well, there you are. It's a very mixed bag. [The book] could have been much better, but it might have been worse. The main troubles are that those who know won't talk, and those who'll talk don't know; that the man who makes the stuff may know most about it, but probably isn't the best man to write about it; that an editor's attempt to be fair and complete leads to unimportant products getting far too much space; and that there is a general conspiracy to make people think that paint is made scientifically these days, whereas everyone in the industry knows perfectly well that paint is made either by rule of thumb or by hit and miss."

Is this I wonder, a fine example of British humour, or is it, by any chance, the awful truth?

"Inhibitors"

HERE'S a fresh viewpoint on the causes and cures of today's acute scientific manpower shortage. James H. Taylor, Director of Industrial Relations for the Proctor & Gamble Company, in an address to the Engineers Joint Council General Assembly in New York declared that once an employer succeeds in placing an engineer (technical man) on the payroll, the employers frequently place "inhibitors" in his natural growth pattern. According to Mr. Taylor, some of thses inhibitors include the following:

—We say we want him to have high technical competence, then we assign him to non-technical jobs, or to jobs which can be performed adequately by non-technical men.

—We say we want him to be creative and imaginative, then we have serious talks with him when he departs from the conventional or time-tested ways.

—We ask for a high degree of professionalization and interest in his field, then if he shows signs of supervisory skills we encourage him to direct his career toward production management responsibilities.

—We require from him identification and loyalty to management thinking, yet we isolate him from the area in which management concepts are involved.

—We emphasize the importance of his contributions as a technical specialist, yet we pass out the kudos and the dollars to the man who becomes an administrator or a production supervisor.

—We again ask for and train to technical skill, yet we freely criticize him when he fails to handle, for instance, simple personnel problems for which he has received no training.

Taylor goes on to say that employees should recognize these fundamental conflicts as essential, necessary and everpresent. The problem is not to attempt to eliminate the conflict, but to handle the problem so that the unwanted negative attitudes will not develop.

Does this shed any light on the disproportionately high turnover rate of technical personnel in the paint industry?

Yeast Oil

"You're the cream in my coffee; you're the lace in my shoe." That's the way paint formulators used to feel about drying oils. Today, however, much of the cream is out of the coffee and the lace out of the shoe and there are strong grounds for suspicion that "They'll none of 'em be missed."

But who can tell? Tomorrow they may be back. And the work of S. W. Challinor and N. W. R. Daniels of the University of Birmingham Department of Applied Biochemistry may be influential in putting them back.

In an article in the December 31, 1955 issue of "Nature", these authors reported on their study of the growth of yeast in a medium in which the concentration of a single growth factor, inositol, was reduced below the normal level. In this environment, the yeast formed large aggregates and were more granular in appearance than normal cells. The deficient yeast cells were obviously unhealthy in appearance and easily ruptured. A little pressure ruptured the yeast cells resulting in a material which was oily in nature and soon coalesced to form large oily globules.

Quantitatively, yields of fat from the inositol-deficient yeast equalled 24.7%, whereas normal cells gave only about 1.6% fat. The exact nature of this oil was not identified in the paper.

Perhaps the authors will make no effort at identification—because their interests seem to lie more in the study of the interrelationships of organisms to environments than in the utilization of metabolic by-products of a diseased organism. Nevertheless, to me, this means that there may exist an infinite variety of esoteric potentially available (via tank farming) oils for future exploitation, should anyone care to explore the possibility.

NEWS

Enter Licensing Pact For Jelled Paints

T. F. Washburn Co. has entered into a licensing agreement with Sears, Roebuck and Co. whereby Sears will produce jelled vehicles under Washburn patents. Initial production will begin at the Pacific Paint and Varnish Co., Berkeley, Cal., a Sears, Roebuck subsidiary.

According to the T. F. Washburn Co., Sears paint research laboratories have been working for some time to perfect a jelled paint that would be truly dripless, even after prolonged agitation. As a result of this research program, Sears technicians have developed a vehicle for the production of jelled paints that meet this standard. The vehicle will be produced under the T. F. Washburn Co. basic patent covering jelled vehicles.

The new product is claimed to withstand repeated dipping of brush or roller applicator without losing its jelled structure. The first paint manufactured with the new vehicle and placed on the market will be a flat wall paint which will be test marketed on the West Coast this summer under the new name "Decor-Eze."

Continental Can Opens $7 Million Chicago Lab

Continental Can Co. last month opened its new $7 million laboratory in Chicago for research and engineering—the largest and most advanced under one roof in the can-making industry, according to T. C. Fogarty, president.

Mr. Fogarty said that 265 scientists and technicians will work in the newly completed building on problems of new metal containers and non-metal components, new machinery to make and close the containers, and new products suitable for packaging in metal and related materials.

The three-story building was designed to meet the company's expansion needs in metal research and engineering over the next 25 years, Mr. Fogarty said. Located on Chicago's South Side (at 76 St. and Loomis Blvd.), the laboratory includes more than 260,000 square feet of floor space.

Continental Can's new $7 million research and development center.

"This is our vote of confidence in the future of the metal container," Mr. Fogarty said. "The can's simple advantages over most other forms of packaging will keep it a strong contender in the current packaging revolution," he asserted.

Lenvik Ylvisaker, general manager of the metal division research and development department is in charge of the metal research and development program in Chicago.

General Ultrasonics Moves

The General Ultrasonics Co., of Hartford, Conn., manufacturers of ultrasonic processing equipment for use in cleaning, degreasing, pickling and electroplating, has moved to a new and enlarged plant at 67 Mulberry St., Hartford 3, Conn.

TOUR PAINT PLANT: Ten students, seniors in high school who intend to major in science in college, last month visited Farnow Varnishes Inc., Long Island City, N. Y., to see for themselves how a plant functions. The students attend school in Brooklyn, N. Y. and belong to the Brighton Manhattan Beach chapter of the B'nai B'rith. After a lively question and answer session, Ben Farber, standing in photo at left, president of Farnow, turned things over to his assistant Leonard Freund, standing at extreme right of right hand photo. Shown also in right hand photo are Harry Handler, center foreground with jacket on, and George Dolgin, standing front with jacket on. Both men are chairmen of youth activities of B'nai B'rith. Mr. Handler is president of General Lighting Co. and Arteraft Lighting Co., Brooklyn, and a member of the Architectural League, and the American Institute of Decorators; Mr. Dolgin is president of Triad Paint Co., Brooklyn. Students who made the tour were Larry Drath, Leonard Frank, Howard Goodman, Peter Handler, Murray Head, Larry Lampert, Mel Meer, Leroy Pelton, Bob Sheetman, and Jerry Simmons.

NEWS

Lehigh U. Club of N. Y. Honors R. L. McCann

R. L. McCann, president of The New Jersey Zinc Co., New York, was the recent recipient of the sixteenth annual "L-in-Life" award presented by the Lehigh University Club of New York.

R. L. McCann

Mr. McCann started his employment with the Franklin-Sterling mining operations of The New Jersey Zinc Co. in Sussex County, N. J., in 1917, following his graduation from Lehigh with a degree of Engineer of Mines. He progressed through various divisions of that organization to become its superintendent in 1930. He was made general manager of mines for the company in 1939, vice president in 1950, and president in 1951.

•

Gibson-Homans Set to Rebuild, Enlarge Facilities

Rebuilding and enlargement of its production and office facilities in Cleveland by the Gibson-Homans Co., producers of protective coatings, mastics, glazing and caulking compounds, was announced by President Norman M. Cornell.

A new one-story plant encompassing 25,000 square feet will be built at 2366 Woodhill Rd., the site of theplant razed in the $750,000 fire last March. Total destruction of the plant and offices resulted from that blaze.

Gibson-Homans also purchased the adjoining property and plant formerly occupied by the International Hose Co. This property includes 43,000 square feet and front at 10709 Quincy Ave.

"The merger of the two parcels of land and the erection of the new plant on the old site has an additional valuable feature," Mr. Cornell said. "The old plant was served by a New York Central Railroad siding on which we received our raw materials. With the merger of the two parcels, we will be able to have railroad facilities servicing the two plants. Our old plant site formerly had cut off this plant from the railroad.

"Our new plant layout will, therefore, be far more efficient since we can design our new space and movement of materials through the plants with an eye to the incoming raw materials and outgoing finish and packaged products," he said.

To avoid any repetition of the destruction of records and materials, the new plants will be made as fireproof as possible and all office records will be placed in fireproof files.

TWENTY YEARS LATER: Success (and receding hairlines?) In 1936, these ten men who had graduated from college together, posed for the picture shown on top. It wasn't a good year for the country economically, nor was it to be for the next few years, but the boys kept at it. This year they posed in the same positions they had assumed twenty years earlier. They are, top row, from left to right: Sidney B. Levinson, technical director, Daniel—Litter Labs. and D. H. Litter Co., Inc., New York City; Alexander C. Haber, technical director, Arnesto Paint Co., Inc., New York City; Alfred Driscoll, paint and varnish consultant, 804 E. 141 St., Bronx, N. Y.; Norman Haber, technical director, T. J. Ronan Co., Inc., Bronx, N. Y.; Joseph R. Cataldo, technical director, Standard Tex & Kalsomine Co., Brooklyn, N. Y. Front row, left to right: Monroe Rapaport, president, Vulcan Lacquer & Coatings Co., Inc., Brooklyn, N. Y.; Joseph Cantor, technical director, N. Y. Woodfinishers Supply Co., Brooklyn, N. Y.; Herman Singer, technical director and vice president, Lehman Bros. Corp., Jersey City, N. J.; Elias Singer, President, Troy Chemical Co., and Benjamin Farber, president, Farnow, Inc., Long Island City, N. Y.

NEWS

"Painting the Town" Campaign Begun by A-D-M

A new community service promotion that triggers two big markets for the paint industry—painting-contractor sales and Week-End Decorator—has been launched by the Archer-Danield-Midland Co., Minneapolis.

It's a "Painting-The-Town" contest, designed to encourage towns and cities throughout the United States and Canada to give new color and life to their business districts and shopping centers with fresh coats of paint.

The "Painting-The-Town" program is designed to tie in with national campaigns being undertaken this year by ACTION (American Council To Improve Our Neighborhoods), OHI (Operation Home Improvement), and the Clean-Up, Paint-Up and Fix-Up Programs, all being directed from Washington, D.C.

This industry-wide program that combines the sales boosting features of two currently popular ADM promotions, Positive Selling for Contractors and the Week-End Decorator, is sponsored by the National Paint, Varnish and Lacquer Association, the Retail Paint and Wallpaper Distributors of America, and the magazine, Living for Young Homemakers.

•

Koppers Buys New Site

Purchase of a 176-acre tract of land near Monroeville, Pa., as the site for a new multi-million dollar research center has been approved by the board of directors of Koppers Co., Inc.

Dr. Paul W. Bachman, vice president and director of research and development, said that Koppers expects that the scope of its research program will be tripled within the next ten years. In this program which the company plans to carry out at the new Monroeville site the necessary research facilities will be provided to take care of its needs for many years to come he asserted.

Goodyear Holds Synthetic Latex Polymer Seminar

More than 150 persons, representing Southern paint, textile, paper, custom compounding and leather finishing industries, recently attended a technical seminar on synthetic latex polymers conducted by the Goodyear Tire and Rubber Company's chemical division in Atlanta, Ga.

The event was held in the Hightower Textile Building at the Georgia Institute of Technology.

Main topics included development, production, evaluation, properties and uses of synthetic latices.

Keynote speaker, Herman R. Thies, general manager of the goodyear chemical division, opened the session by presenting a broad review of the relatively new synthetic latex industry.

J. D. D'Ianni, assistant to the vice president in charge of research and development at Goodyear, discussed the "Theoretical Consideration of Polymerization and Latex Characteristics."

Goodyear chemical division personnel who participated in the technical seminar at Georgia Institute of Technology, are, left to right: W. F. Gerrow, Atlanta district manager; W. C. Smith, latex and adhesives section head; C. O. McNeer, general sales manager; Dr. J. D. D'Ianni, assistant to the vice president in charge of research an development; E. W. Scott, sales service representative; A. E. Polson, plastics department manager.

Other speakers included A. E. Polson, W. C. Smith, and E. W. Scott. Topics ranged from a consideration of basic latex properties to typical end-use applications. Question and answer sessions highlighted the morning and afternoon meetings.

Glidden to Spend $15 Million In Additions

The Glidden Co. will spend more than $15,000,000 in capital additions in 1956, Dwight P. Joyce, chairman and president, reported.

Addressing the St. Louis chapter of the Society of Security Analysts last month, Mr. Joyce said the company's expansion plans call for a substantial increase in the capacity of the company's St. Louis paint manufacturing facilities—possibly a complete new paint plant.

"Glidden's growth in St. Louis has paralleled that of the city itself," he said. He pointed out that in the last 10 years Glidden's St. Louis paint plant has increased its sales by nearly 200 per cent. "This is indicative of the constantly growing importance of this market," he said. "It reflects the progressive spirit of this city, which is so evident in its vigorous slum clearance, highway and school programs. Glidden intends to keep pace with the community itself."

Major units in the company's expansion program are the new $8,000,000 titanium dioxide plant in Baltimore, the new $6,000,000 terminal grain elevator in Chicago and new or additional paint production facilities at Atlanta, Montreal and other locations.

Stressing the company's policy of eliminating plants, products or processes which do not produce proportionate returns, Mr. Joyce said Glidden has decided to dispose of its soybean and flaxseed crushing operations at Buena Park, Cal.

NEWS

Credit Plans Available For Morehouse Mills

In a move to simplify leasing and credit arrangements for Morehouse Mills and Cowles Dissolvers, Morehouse-Cowles, Inc., of Los Angeles has announced details of two specific plans. According to D. L. Grubbs, general manager of Morehouse-Cowles, Inc., distributors, the plans are incorporated in two new booklets for use by prospective buyers.

A booklet on the leasing plan, prepared in cooperation with International Leasing Corp., explains a method for procuring use of Morehouse-Cowles equipment without greatly expending working capital. Under the ILC plan the only cash required is one month's rental for each year. Lease is then renewable indefinitely from year to year at sharply reduced rates.

A booklet on credit arrangements describes the Equipment Financing Plan of the Commercial Credit Corp., and includes details of typical examples. The plan gives great flexibility in permitting the choice of a payment program geared to the user's own methods of calculating depreciation. A 25 per cent down payment initiates the program.

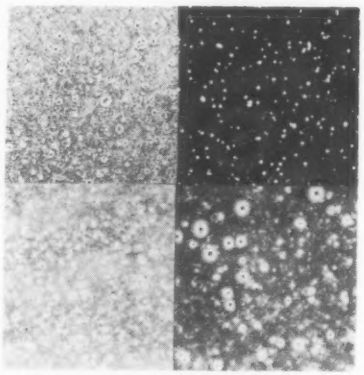
Under either plan, both Morehouse Mills and Cowles Dissolvers may be combined in one contract. Installation and transportation charges may be included, and the full Morehouse-Cowles Purchase Warranty applies.

The booklets are available from Morehouse-Cowles, Inc., 1150 San Fernando Rd., Los Angeles 65, Cal., or from representatives in principal cities.

•

Striped Paint? No, But How About Speckled?

The painter's favorite practical joke is to send his new apprentice for a bucket of striped paint. Now they've come up with a product just as startling—speckled paint. The new coating dries in a variety of two color speckled patterns in any shades desired, and may be brushed, sprayed, or rolled on.



Four typical drying patterns.

The speckled effect is produced by minute particles floating in the paint which might be likened to miniature tadpoles. These particles have large "heads," and smaller "tails." The heads are composed mainly of aluminum pigment—the tails of resins and solvents. By a newly-developed process, the heads of these particles are made non-polar, which means they repel each other. The tails, on the other hand, attract other tails.

The man who developed the new product, and who is putting it into production, is Walter Lox, director of new products research for Forman-Ford and Co., Minneapolis. He worked closely with Reynolds Metals Co., Louisville, supplier of the non-leafing aluminum pigment which is a necessary ingredient, during the 12 months he spent developing the new product.

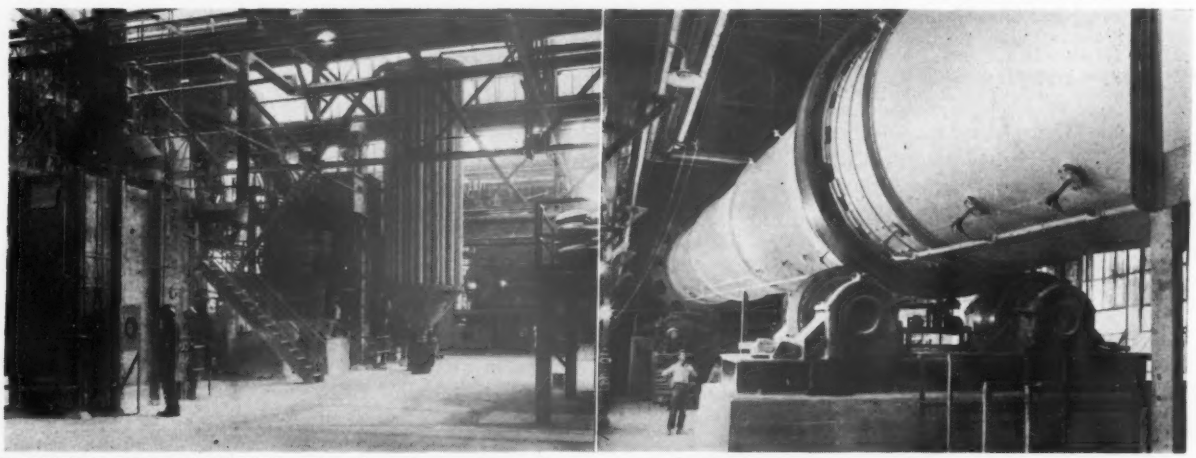
The paint comes in two cans—one is a base coat, and one the finish coat. Size of the speckles is varied by the time the base coat is allowed to dry. The paint will be available in either glossy or semi-glossy finish, and according to tests conducted by Lox, it has excellent weathering characteristics. The price, he said, will be comparable to that of any good enamel.

•

New United Carbon Office

United Carbon Co., Inc., Charleston, W. Va., has announced the opening of a sales office at 3932 Wilshire Blvd., Los Angeles 5, Cal., to serve its customers on the West Coast.

Burton S. Smart, Jr., formerly of the southern sales district in Memphis, Tenn., is in charge of the new office. Its telephone number is Dunkirk 4-9368.



FURTHER DEVELOPMENT: The New Jersey Zinc Co. recently took a big step in its diversification program when it entered the titanium pigments field with the purchase of a plant fully equipped and staffed, and producing titanium dioxide at an annual rate of somewhat over 20,000 tons per year. The new plant is located at Gloucester City, N. J. Photo at left shows a grinding mill section of the plant, at right is a section of a 150-foot rotary kiln for calcinating operation.

It's Performance That Counts!

You can rely on the performance of

*ODORLESS PHILLIPS 66 SOLTROL**

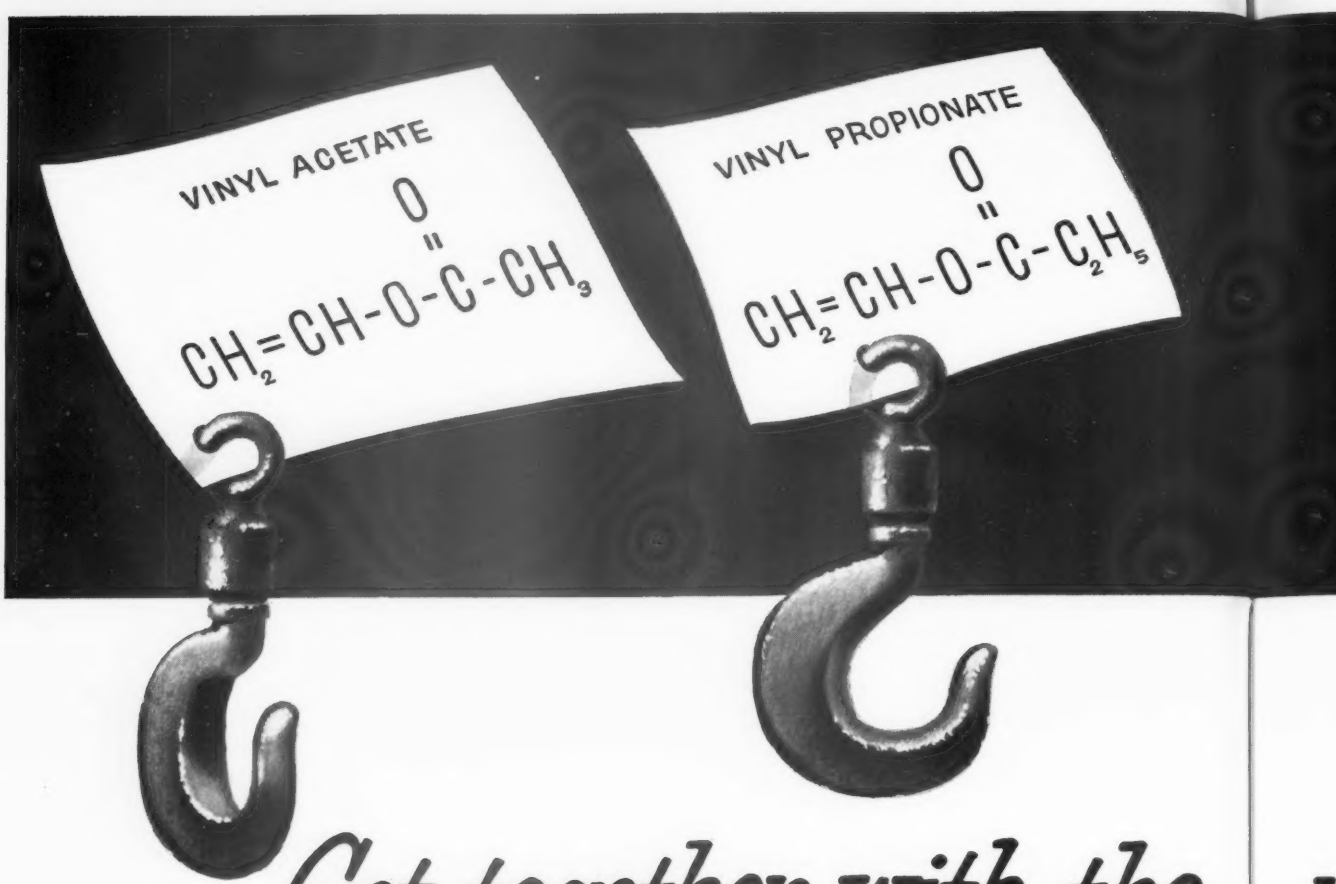
Count on Phillips, too, for dependable supply and fast deliveries in 4,000 or 8,000 gallon tank cars, or in 6,000 gallon compartment cars containing both Soltrols. Order Soltrol 130 for conventional drying characteristics, Soltrol 170 for longer wet edge. Write for FREE samples of these high quality, *odorless* thinners.

*A Trademark

ODORLESS MINERAL SPIRITS

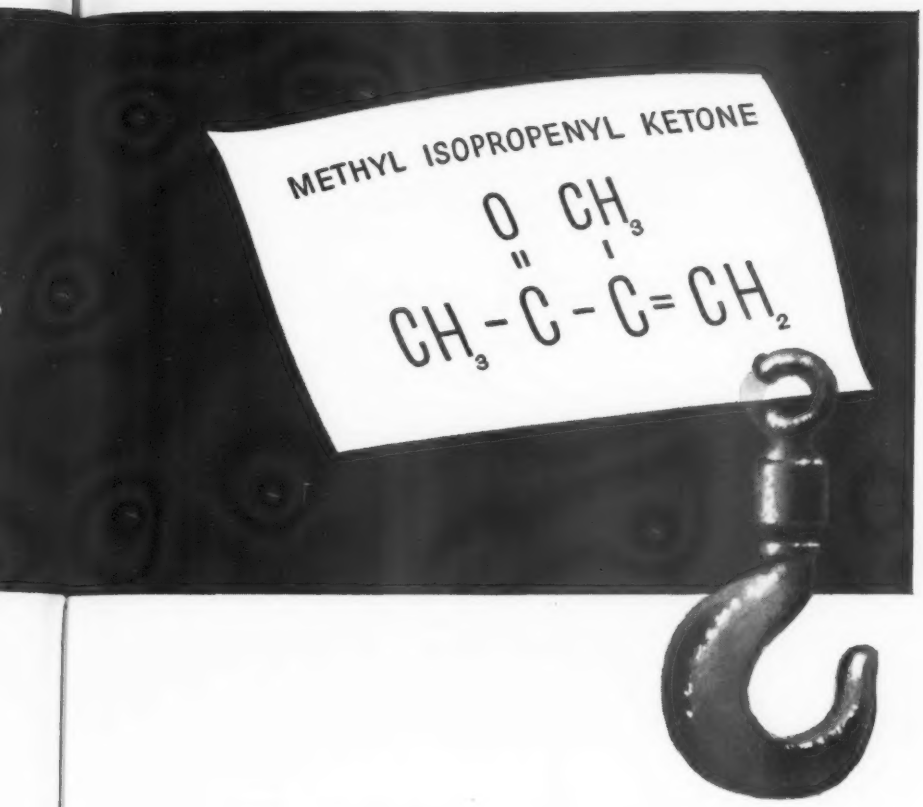
Phillips 66 SOLTROL

PHILLIPS PETROLEUM COMPANY
SPECIAL PRODUCTS DIVISION
BARTLESVILLE, OKLAHOMA



Get together with the

	VINYL ACETATE	VINYL PROPIONATE	METHYL ISOPROPENYL KETONE
	Specifications	*Descriptive Data*	*Descriptive Data*
Distillation Range @ 760 mm, °C	71.8-73.0	within 6° spread including 94.9	98
Color APHA, max.		30	water-white
Water, % wt., max.	0.15	0.25	
Specific Gravity @ 20°/20°C	0.9330-0.9340	0.9160-0.9185	0.854
Acidity as acetic acid, % wt., max.	0.02	0.1	



right Vinyl Monomer . . .

Celanese now offers industry a choice of 3—
for better emulsion paints, adhesives, coatings, finishes, laminates, plastics, and synthetic rubbers

Celanese now offers you three Vinyl monomers—a flexibility of choice that provides new opportunities to improve your products and processes.

Like the popular Vinyl Acetate monomer, Celanese Vinyl Propionate and Celanese Methyl Isopropenyl Ketone have the "vinyl" ability to combine with themselves as well as with a wide number of compounds to produce homopolymers and copolymers with distinct advantages.

The Celanese Technical Service & Applications Laboratories is ready to work with you in your development work. For complete technical data, write to Celanese Corporation of America, Chemical Division, Dept. 553-G, 180 Madison Avenue, New York 16.

Celanese* CHEMICALS

*Reg. U. S. Pat. Off.

NEWS

Hercules Research Center Twenty-Five Years' Old

The vital role of research and development in the chemical industry today is exemplified by the growth in size and scope of Hercules Powder Company's central research laboratories near Wilmington, Del., which have just completed twenty-five years of operation.

This expansion at Hercules' Experiment Station has resulted in a new name for the facility—Hercules Research Center—which more accurately portrays the nature and breadth of the company's research program at this location.

Located seven miles west of Wilmington, Delaware, the Center today employs approximately 750 men and women, under the direction of Dr. Peter Van Wyck. Most of the staff are specialists and technicians, and almost 300 of them professional scientists and engineers. In 1931, there were 125 employees, most of whom were transferred from Hercules' laboratories at Kenvil, N. J. established in 1915.

The company's expenditures for research at the time of opening of the Experiment Station were about $450,000 annually. At the present time, the rate is almost $8,000,000 annually for the Hercules research program.

In April, the Center marked the completion of twenty-five years of widening performance and continued growth in its ability to carry out research responsibilities, with facilities which far outstrip those at its command in 1931.

Research growth was geared to development of the company, best illustrated by a contrast of net sales in 1930 of $23,500,000, with an all-time high in 1955 of $226,651,000.

"The basic concept is still the same—the extension of man's useful knowledge concerning chemical materials for industry," said Dr. Robert W. Cairns, Hercules' director of research.

"In this first quarter century we have built an organization of skilled scientists and engineers, backed by the finest buildings and research equipment, to perform truly as a research center for Hercules and the industries we serve. Our work covers all phases of the research process, from the search for new chemical ideas to the commercial development of new manufacturing processes and product applications," he asserted.

•

Barrett to Expand "Plaskon"

Barret Division, Allied Chemical & Dye Corp., has announced plans for substantial expansion of its production of "Plaskon" polyester and liquid phenolic resins at its Toledo plant. Plans call for more than doubling polyester resin capacity and nearly quadrupling phenolic resin capacity. The new facilities will come into operation by stages with final completion by mid 1957.

•

N.Y.C. Paint Regulation

The Fire Department of New York City recently sent out a reminder of a regulation governing the sale of paint products in the city. The regulation states: "Adopted June 1, 1954. RESOLVED, that when a paint product is distributed for sale under an expression other than paint, the words, 'Paint Product,' shall be legibly printed on the front portion of container labels."

NOW You Can Stop Pressure Build-Up in Aluminum Paints With SYLOID® AL-1

Tests conducted by the Aluminum Research Laboratories of Aluminum Company of America ". . . indicate that SYLOID AL-1, when used in concentrations up to 1% based on total weight of paint, effectively retards pressure development in ready-mixed varnish base aluminum paint containing moisture in concentrations up to 0.5%."

This problem of pressure build-up in ready-mixed aluminum paints has long been a serious one. Now this pressure development can be stopped. The leaf stability of the paint is not affected and the drying rate is not retarded.

For complete information on SYLOID AL-1, including results reported by Aluminum Research Laboratories, write

Progress Through Chemistry

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS

looking for SOLVENTS of CONSTANT UNIFORMITY?

Sun Toluene, Xylenes and Sun Spirits mean high-quality paints, varnishes. You get protective coatings of constant uniformity.

These Sun Solvents, because of controlled volatility, give you even drying... assurance of durable finishes.

Their controlled uniformity makes it easier for you to maintain a constant viscosity in your finished product.

The unique purity of Sun Toluene and the narrow distillation range of Sun Xylenes have proved valuable in the protective coating field.

For further information, see your Sun representative, or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. PV7

SUNOCO

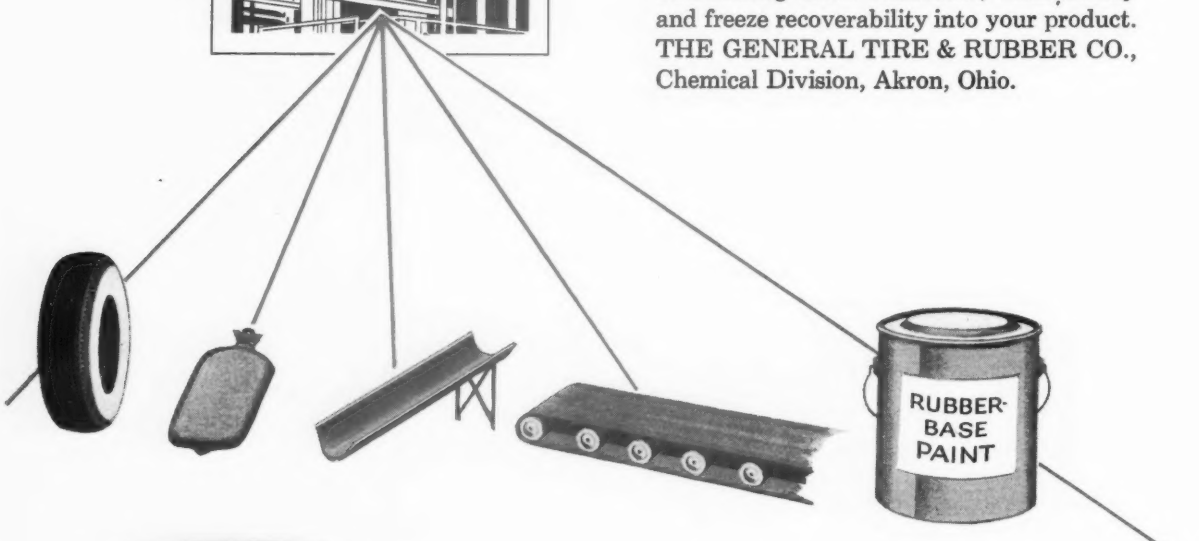
INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

Rubber has proved its superiority!

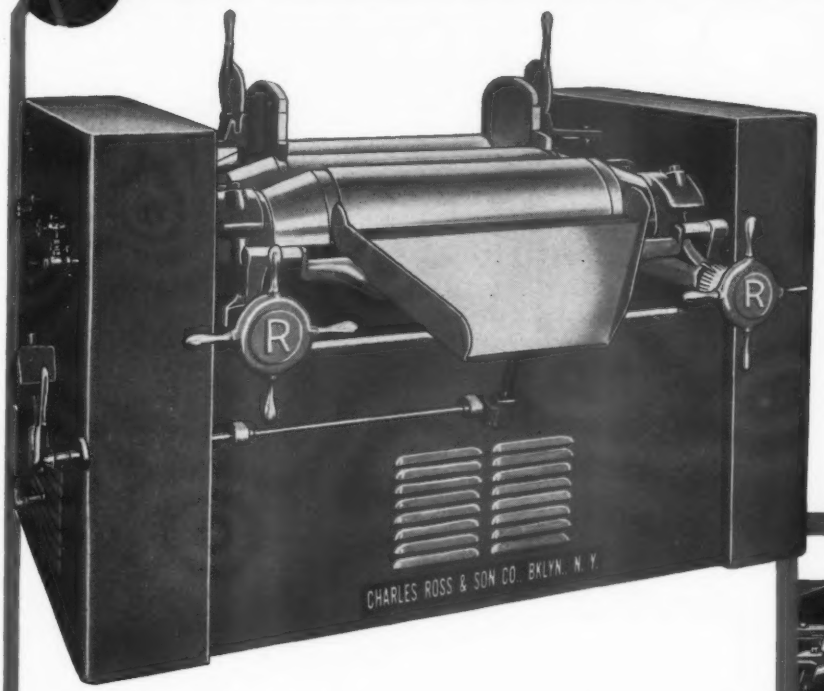
50,000,000 gallons of rubber-latex paint sold in 1955 proves the public's enthusiastic acceptance of its superiority. Cash in on the rapidly increasing demand for latex paint. Get a sample of GEN-FLO 67 and try it for yourself. GEN-FLO will build outstanding scrub resistance, cleansability and freeze recoverability into your product. THE GENERAL TIRE & RUBBER CO., Chemical Division, Akron, Ohio.



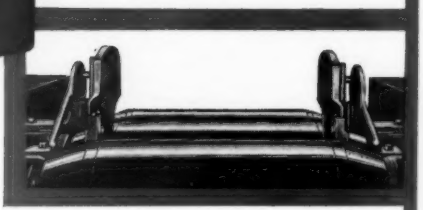
Chemical Division
GENERAL
THE GENERAL TIRE & RUBBER CO.
GEN-FLO

Creating Progress Through Chemistry

FOR GREATER PRODUCTION AND LOWER OPERATING COSTS



The latest Ross #52TC 14" x 32" High Speed Three Roll Mills are precision engineered and designed for the greatest possible production of high quality dispersions. They will out-perform all other mills of comparable sizes.



The #52TC—14" x 32" Mill, like all Ross Mills, is readily CONVERTIBLE for operation either with fixed center roll and four point adjustment or for operation with floating center roll and two point adjustment. To convert from one type operation to the other is easily done within minutes by any operator, without special kits or tools.

LARGER roll area than any comparative size mill for greater production.

VERSATILE to permit perfect adjustment of rolls, apron, and other parts to meet the various milling requirements of different materials.

RUGGED in construction for dependable trouble-free operation.

Why Ross Mills are preferred by leading plants throughout the country

1. **FRAME** of extra heavy cast iron for rigidity and perfect roll alignment.
2. **ROLLS** of highest quality with extra hard chilled surface, uniform chill depth, and chamber bored for full length cooling. Special high ratio of differential speeds gives greater shear and larger production.
3. **GEARS** extra heavy with wide face helical cut for smooth quiet operation.
4. **BEARINGS** heavy duty SKF self-aligning roller bearings. They carry about one-half their rated load capacity, are tested and guaranteed for all operating conditions.
5. **MOTOR** mounted in Mill frame and lubricated from outside of Mill. Two speed motor when required.
6. **DRIVE** heavy silent chain drive in continuous oil bath lubrication. Chain tension adjustable for efficient power transmission and quiet operation.
7. **APRON** can be raised or lowered to most efficient take-off position for light or heavy materials. Specially balanced for uniform pressure of razor knife on front roll. Constant pressure is maintained as knife wears providing continuous thorough take-off of material for maximum production.
8. **ADJUSTMENT** facilitated by thrust bearings in handwheels for rapid setting or disengaging of rolls. Improved large calibrated indicating dials assure sensitive accurate roll adjustment. With corresponding dial readings, parallelism of roll faces is positively controlled. Setting is direct, has no intermediate wearable parts, will not lose effectiveness or accuracy.
9. **END PLATES** quickly raised for cleaning by lever operated lifting devices. They are securely locked in both cleaning and operating positions. End plates ride on tapered roll ends, off production face of rolls, allow use of full 32" production face of rolls for greater output. Large fixed hopper with detachable side pieces furnished when preferred.

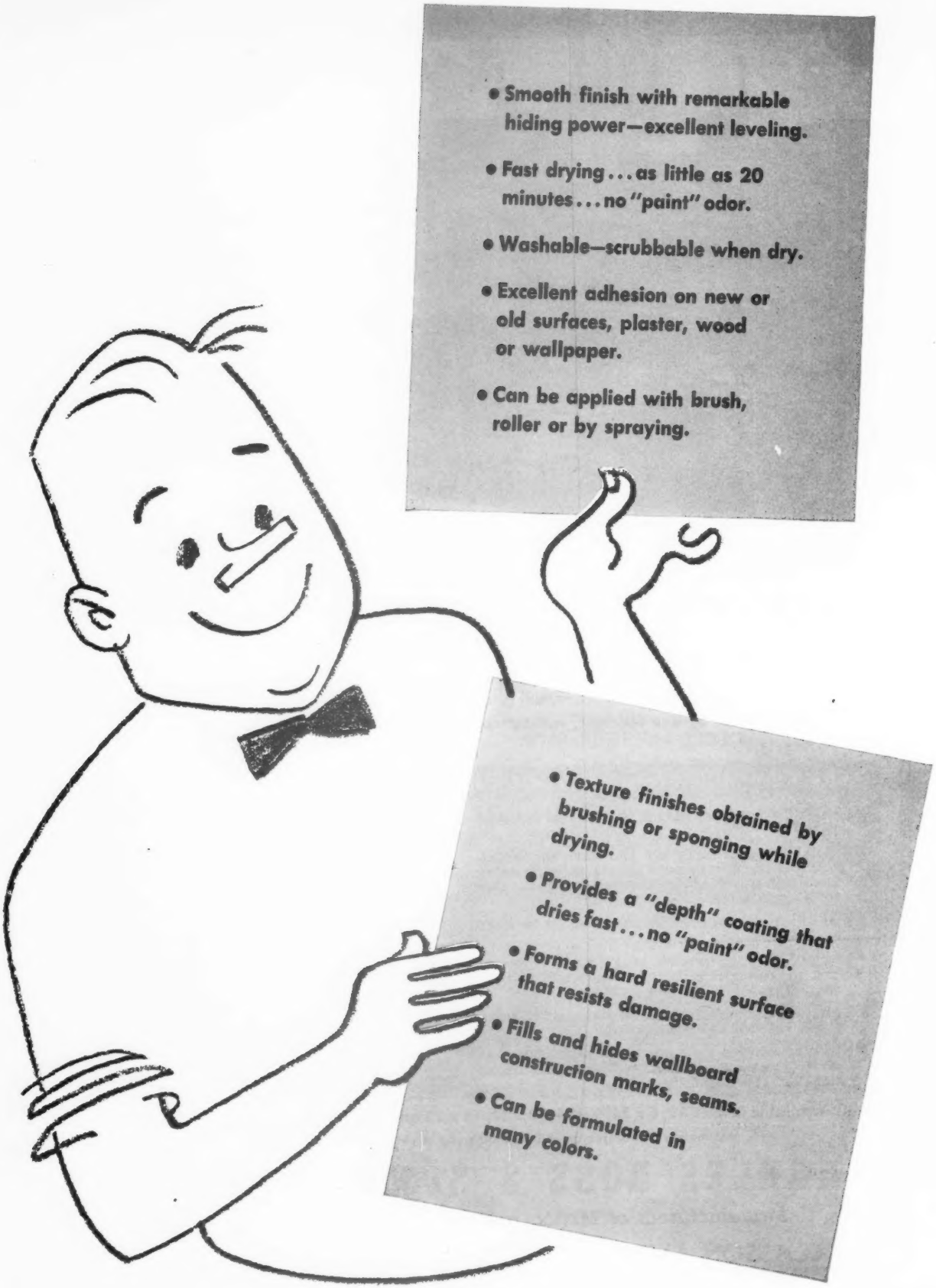
Mills available in 4½ x 10, 6 x 14, 9 x 24, 12 x 30, 14 x 32 and 16 x 40 inch sizes. Write for further details!

Information on our *guaranteed reconditioning service* for mills of all types on request.

CHARLES ROSS & SON COMPANY, INC.

Manufacturers of Mixing and Grinding Machinery Since 1869

148 CLASSON AVENUE BROOKLYN 5, NEW YORK


• Smooth finish with remarkable hiding power—excellent leveling.
• Fast drying . . . as little as 20 minutes . . . no "paint" odor.
• Washable—scrubbable when dry.
• Excellent adhesion on new or old surfaces, plaster, wood or wallpaper.
• Can be applied with brush, roller or by spraying.
• Texture finishes obtained by brushing or sponging while drying.
• Provides a "depth" coating that dries fast . . . no "paint" odor.
• Forms a hard resilient surface that resists damage.
• Fills and hides wallboard construction marks, seams.
• Can be formulated in many colors.

Which list of coating characteristics do you want?

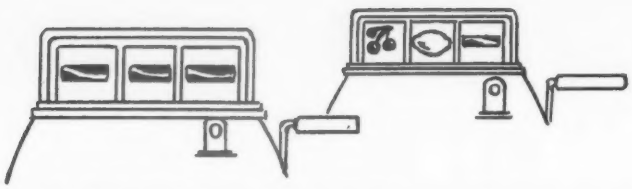
Take your pick... they are both obtainable in formulations based on BAKELITE Polyvinyl Acetate Latex WC-130 ...superior performance that boost sales!

The outstanding qualities of BAKELITE Brand Polyvinyl Acetate Resin Latex WC-130 are in large part responsible for these unusual properties. Why not investigate this business-building polyvinyl acetate latex? Write today for technical bulletins to Dept. RJ-153

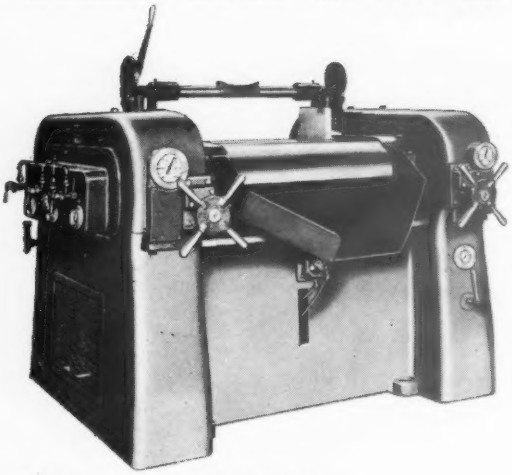
BAKELITE Vinyl, Polyethylene, Phenolic, and Epoxy Resins and Styrene and Vinyl Acetate Latexes for Coatings.

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC



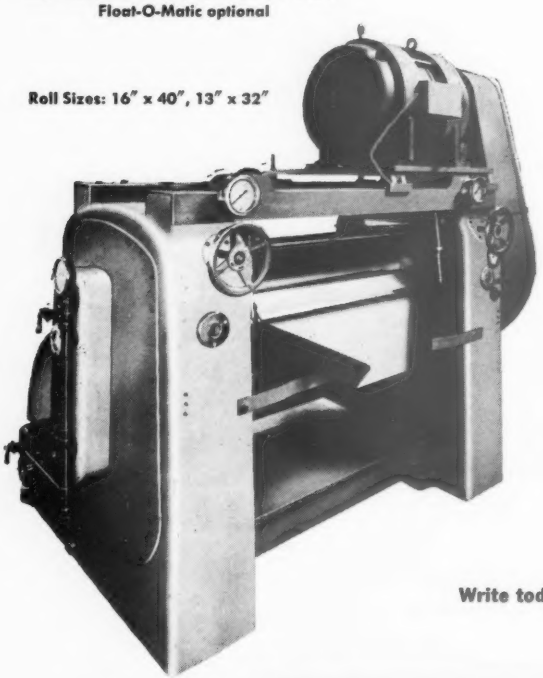
ONLY ONE COMBINATION REALLY PAYS OFF



Roll Sizes: 16″ x 40″, 13″ x 32″, 9″ x 24″
Float-O-Matic optional

...IN LOW COST PAINT MILLING, TOO!

Roll Sizes: 16″ x 40″, 13″ x 32″



It's no gamble when you choose the Lehmann high production economy pair of Three Roll Paint Mills to help you increase your production profits. Together the 631-V Vertical Mill for large batch, high production work and the 662-V Horizontal Mill for small batch production, reduce paint milling costs more than any other combination of mills . . . providing more profits to plants large or small.

Both of these mills are equipped with Lehmann's exclusive *threefold* Sight-O-Matic* gauge control over (1) dispersion, (2) take-off efficiency, (3) product temperature. All adjustments are simpler, faster, more accurate.

Lehmann is also equipped to offer milling research service on samples of your formulations, without obligation, and Certified Factory Reconditioning Service on any of your present mills.

Write today for further details on any of Lehmann's machines or services.

*Reg. U. S. Pat. Off.

LEHMANN®

J. M. LEHMANN COMPANY, Inc.

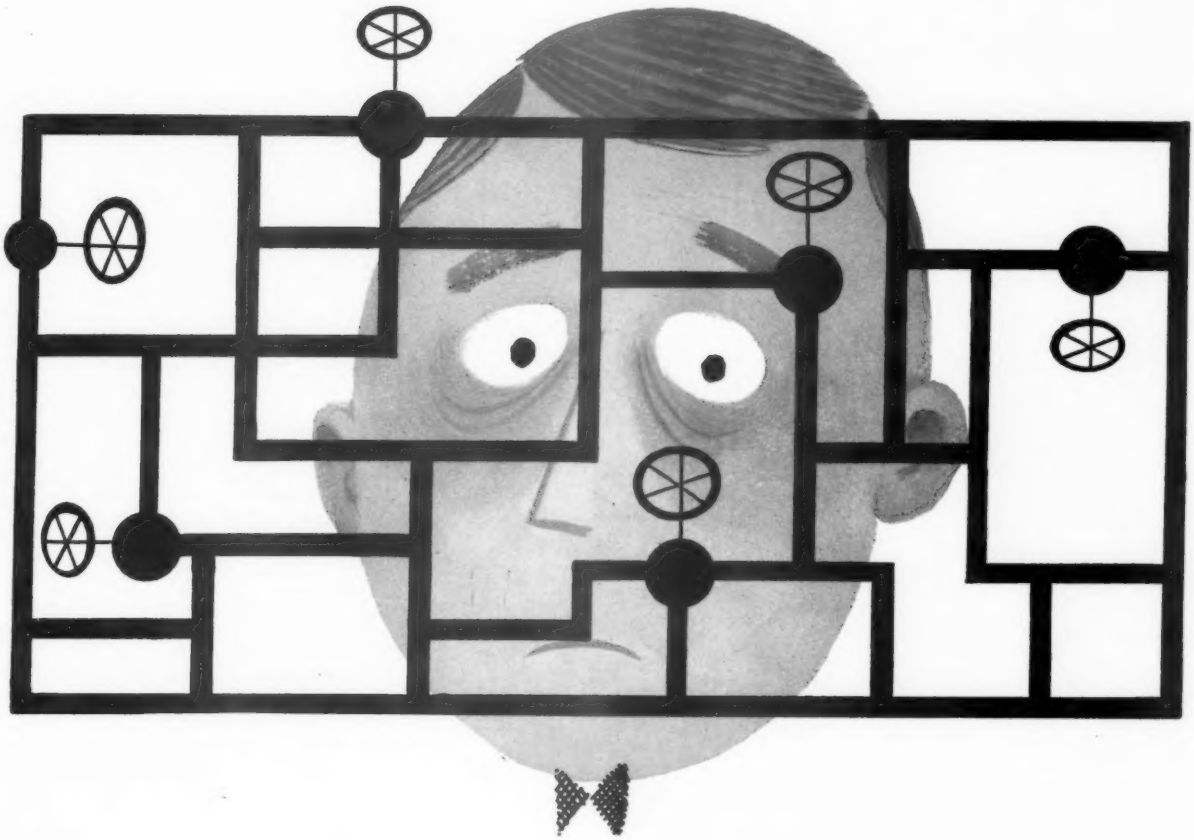
COAST-TO-COAST SERVICE

Moore Dry Dock Company
Oakland, California

Lammert & Mann Co.
Chicago 12, Illinois

J. M. Lehmann Co., Inc.
Lyndhurst, New Jersey

Processing Problem?



try **Velsicol** *hydrocarbon resins*

If processing worries follow you home and haunt you, it's time you had a chat with your Velsicol Representative. He's a qualified chemist, who can explain how manufacturers of paints, coating vehicles, and curing compounds have simplified processing through the greater solubility and compatibility characteristics of Velsicol Hydrocarbon Resins. He can supply samples for test work, and acquaint you with the services of the Velsicol Resins Laboratory. Contact him soon. There's no obligation involved—just opportunity.

Look for this man!

...your Velsicol representative, a qualified chemist who can show you how to make better paints and coating vehicles at lower cost with Velsicol Hydrocarbon Resins.

VELSICOL

Mail This Coupon For Free Technical Literature!

VELSICOL CHEMICAL CORPORATION
330 East Grand Ave., Chicago 11, Illinois Dept. 56

Gentlemen:

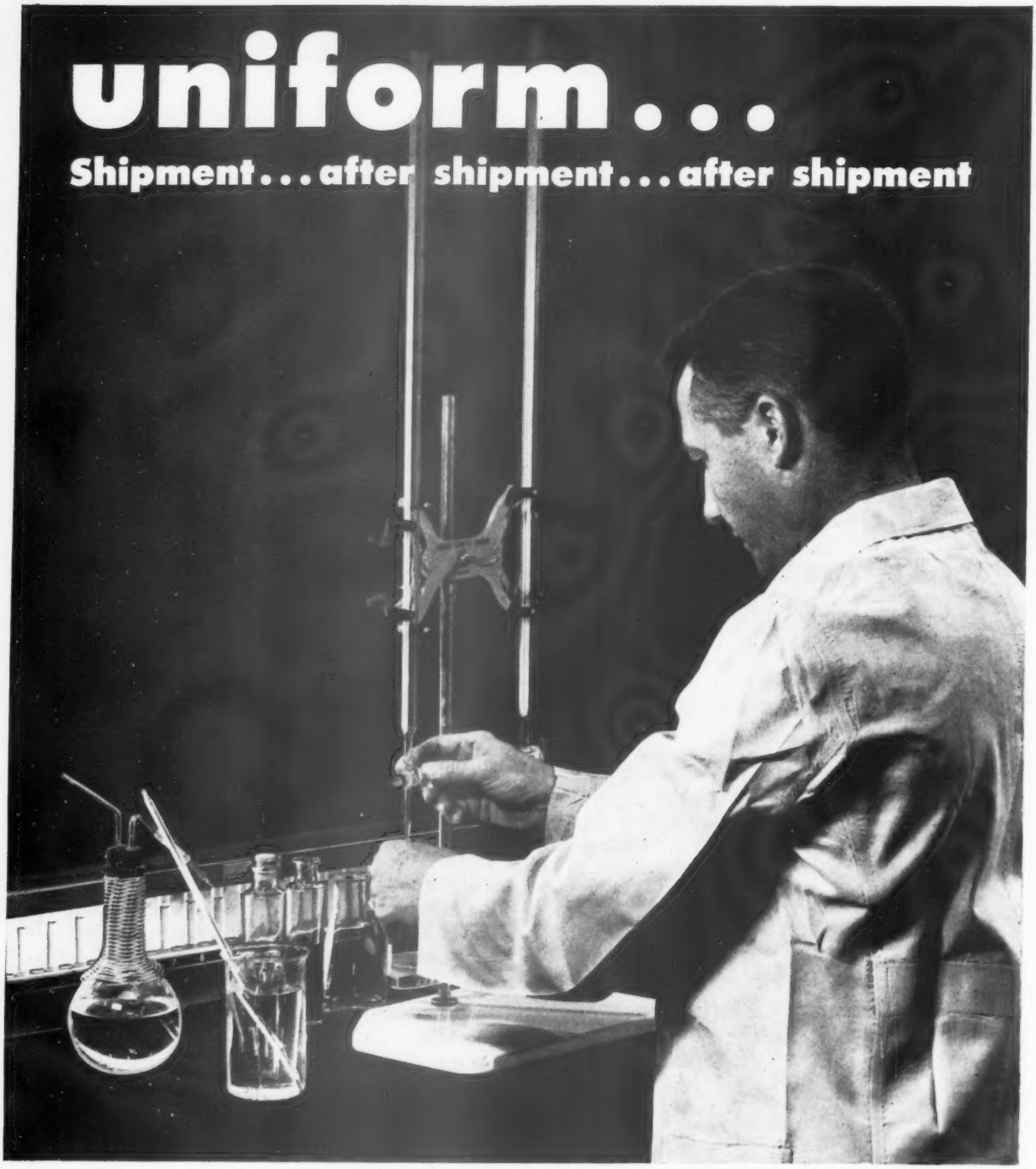
☐ Please send me your Technical Bulletins No. 218.
☐ Please send me samples of Velsicol Resins.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____



Cargill Incorporated

PRODUCT OF Cargill CREATIVE PROCESSING

Suppliers to the Paint and Varnish Industry

Linseed Oil • Soybean Oil • Fish Oil • Alkyd Resins • Specialty Products

NEWS

Continual Growth Shown By Molybdate Orange

U. S. consumption of molybdate orange pigment reached 12,578,000 pounds in 1955, a record surpassing by 30 per cent the previous all-time record high registered in 1954 when 9,602,000 pounds were consumed.

This increase, revealed in figures released by the Bureau of Census, Department of Commerce, is the greatest for any one year in ten years of continual growth in consumption of this molybdenum pigment (also called molybdenum orange and molybdate chrome orange). During this decade in which it has become a pigment of major importance in paint applications requiring high visibility and in printing ink, consumption has increased more than six-fold.

New applications range from finishes for military aircraft to paint for expensive automobiles. For example, molybdate orange is now included in the specification for aircraft gloss enamel (MIL-E-7729A) and gloss cellulose nitrate lacquers for aircraft (Amendment 3, MIL-L-7178). Molybdate orange is also used in new red and maroon automobile finishes.

•

Heyden Resorcinol Plant

Heyden Chemical Corp. will construct a new plant at Fords, N. J., with capacity for 3,000,000 pounds of resorcinol, an essential ingredient in waterproof glues and adhesives it was recently announced by Simon Askin, president. Construction is scheduled to begin in the first quarter of 1957 and completion is planned by Dec. 1, 1957.

•

Air Reduction Co. Moves

Air Reduction Co., Inc. has moved its executive offices into the new Socony-Mobil Building, 150 E. 42 St., New York 17, N. Y. The company had been located for the past 26 years in the Lincoln Building, 60 E. 42 St., New York City. The phone number, Murray Hill 2-6700, remains the same.

CONGRATULATIONS: That's what Vic Marchi, left, president of the Pacific Northwest Paint & Varnish Production Club, says to Norman A. Sipple as he informed him that the Club had selected him teacher candidate for the Paint Short Course for High School Chemistry Teachers at North Dakota Agricultural College. Mr. Sipple teaches at Washington H.S. in Portland, Ore. The course is sponsored by The Federation of Paint & Varnish Production Clubs.

C. C. McInnes Re-Elected

Clyde C. McInnes, of American Mineral Spirits Co., was recently re-elected president of the Chicago Paint, Varnish and Lacquer Association for the coming year. Other officers elected were Linus O. Smith, vice president; A. P. Stresen-Reuter, treasurer, and Francis P. Squibb, secretary.

•

New Chicago Sales Office

The Chicago sales offices for two divisions of The M. W. Kellogg Co.—the chemical manufacturing division and the chimney division—are now located at 221 N. LaSalle St. They were previously at 79 East Adams. The new telephone number in Chicago is Central 6-2871.

Your dependable source of
HYDROCARBON
aromatic
SOLVENTS

PRODUCT OF AMOCO

These five types of high quality paint solvents are available to meet your immediate production requirements. With Pan American's privately owned fleet of tank cars, we can make shipment the same day as receipt of your order.

TYPE:	PHYSICAL PROPERTIES RX-3	RX-5	RX-21	RX-22	RX-28
DISTILLATION, °F. Percent Off					
IBP, Min.	270	350	315	360	300
50%	293-307	365-380	—	—	335-350
DP, Max.	375	425	350	415	400
FLASH, T.C.C., °F. Min.	80	130	100	130	100
KAURI-BUTANOL VALUE, TOLUENE—105	75.0-77.0	68.0-70.0	—	—	70.0-72.0
AROMATICS, VOL. % Min.	—	—	90.0	92.0	—
COLOR	water white				

For samples, prices and detailed information, write or phone

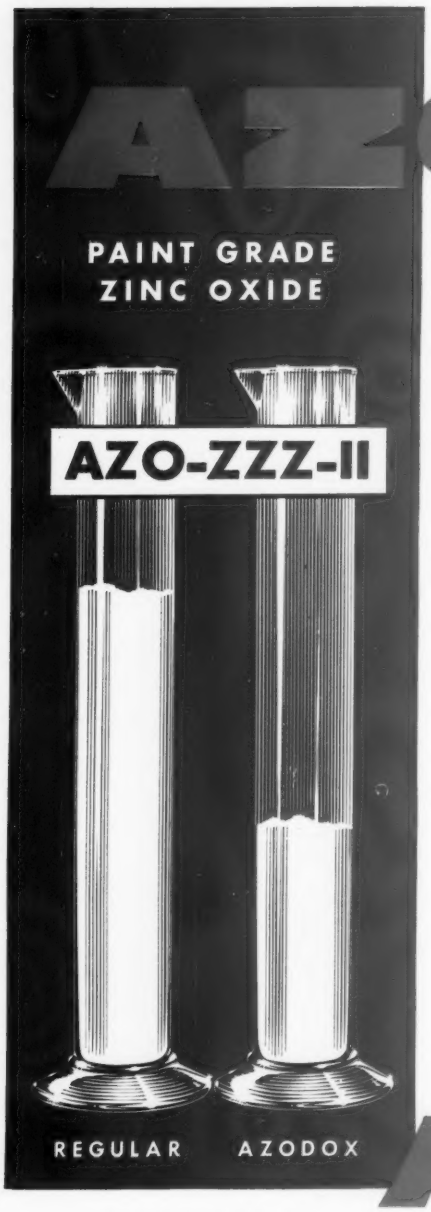
PAN AMERICAN CHEMICALS CORP
555 FIFTH AVENUE, NEW YORK 17, N. Y.

PAN AMERICAN CHEMICALS

PANAREZ Hydrocarbon resins • PANAPOL Hydrocarbon drying oils

Good news for the Paint Industry

NOW! NEW FORM OF HIGHER DENSITY ZINC OXIDE CUTS COSTS, DOUBLES STORAGE CAPACITY, SPEEDS PRODUCTION WITH *NO* CHANGE IN CHEMICAL PROPERTIES AND WITH *ONLY ONE* CHANGE IN PHYSICAL PROPERTIES . . . *APPARENT DENSITY.*



Dramatic proof of the high density of AZODOX, as compared with AZO-ZZZ paint grade zinc oxides which, themselves, are more dense than conventional zinc oxides.

AZODOX

DE-AERATED ZINC OXIDE

AZODOX is the result of a manufacturing process new to the zinc oxide industry. Here, at last, is a zinc oxide with all the desirable qualities of AZO-ZZZ, American Process, paint grade zinc oxides—plus time-saving, labor-saving and money-saving advantages that no other form of zinc oxide possesses to the same degree. Samples and test lots of factory proved AZODOX now available for you. *There is no increase in price over conventional zinc oxide.*

HERE'S WHY AZODOX IS BEST FOR YOU

Twice the Density, Half the Bulk. AZODOX cuts storage space in half. Despite high density, perfect texture of material is unchanged. AZODOX package is shaped, permitting close-packed, well-formed unitized shipments.

Increased Mixing Capacity. AZODOX incorporates readily in oil, disperses completely. Its high density, low bulk gives greater capacity, steps up production of both mixers and mills.

Flows More Freely, Less Dusting than conventional zinc oxides.

Physical Properties Unchanged Except for Density. Consistency, particle size and shape, color and all other physical properties *except apparent density* are unaltered. And *all* chemical properties are unchanged.

Azodox Cuts Your Costs. Faster handling, easier storing, quicker mixing save you money.

American Zinc sales company

DISTRIBUTORS FOR AMERICAN ZINC, LEAD & SMELTING COMPANY

COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.

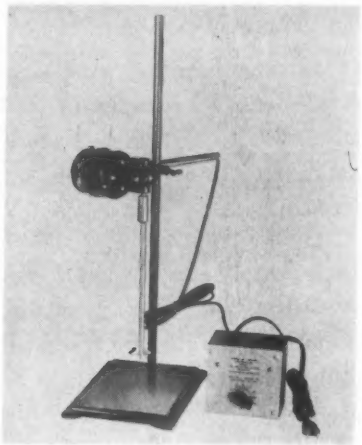
INSTRUMENT

COLOR COMPUTER
Gives Quick Results

New electronic color tolerance computer, used with a color-photometer, computes deviations from color standard and presents the answer as a single number on a dial calibrated in NBS (National Bureau of Standards) units. The calculation is said to be completed within one minute. When deviation beyond the acceptable tolerance is shown, the computer will present, in NBS units, the precise color errors: light-dark, red-green, and yellow-blue. According to the manufacturer, this instrument will compute the correction necessary to obtain the required color. When it has computed the correction, the formula can be brought within tolerance standards with a minimum of color adjustments. Instrument Development Laboratories, Inc., Dept. PVP, Needham Heights, Mass.

POLYESTER RESINS
Complete Line

Company announces it is in production on a complete line of polyester resins. In addition to its Amester 722, General Purpose, and Amester 722 L.S., Light Stabilized, it now has in production Amester 502, Reactive; Amester 552, Matched Metal Die Resin; Amester 722 L.V., Low Viscosity; Amester 822, Thixotropic; Amester 852, Fire Retardant; Amester 922, Flexible and Amester 1022, Gel Coat. Amester Polyester Resins for Rigid and Flexible foams, based on polyester-isocyanate formulations are available. American Alkyd Industries, Dept. PVP, Broad and 14 St., Carlstadt, N. J.



HELLER

LABORATORY STIRRER
100-120 rpm

The Heller #69 stirrer, designed for general laboratory stirring, can also serve as a shaker drive for Van Slyke apparatus and separatory funnel extractions, according to manufacturer. Stirrer operates on 110 volts, 60 cycles, single phase; motor is a gearhead, series wound motor; develops 1/40th hp at top speed; maximum output torque said to be 1 to 2 inch pounds; 10:1 bronze gear reducer; operates with speeds from 100 to 1200 rpm in eleven discrete steps; motor is controlled by a tapped auto-transformer. The controller cabinet is made of sheet steel, enameled with silver gray hammerloid, and measures 4″ x 4″ x 2½″ high. Gerald K. Heller Co., Dept. PVP, 1 N. Carey St., Baltimore 23, Md.

FATTY ALCOHOL
Odorless

"Adol 45," a long chain diol with a high melting point and two OH groups, is said to be a practically odorless, stable, white solid derived from hydrogenated castor oil, melting at 69° C.

This hydroxy stearyl alcohol is claimed to have outstanding potential for compounds such as plastics, resins, solubilizers, stabilizers, emulsifiers, polyesters and surface active agents—detergents, intermediates, waxes and esters. Chemical Products Div., Archer-Daniels Midland Co., Dept. PVP, 2191 W. 110 St., Cleveland 2, Ohio.

THICKNESS GAGE
Measures 0-60 Mils

New permanent-magnet thickness gage, developed by General Electric Co., is a portable, self-contained gage small enough to be held in the hand. Designed for non-destructive thickness measurements of nonmagnetic coatings, such as paint or plating, on magnetic iron or steel, unit can also measure other nonmagnetic materials when they are placed on a smooth, magnetic plate. The gage made of lightweight, break-resistant plastic, also measures coatings on external, internal or compound cylindrical surfaces—provided it is calibrated on a sample of the base material of the same shape and composition. Distributed by Gardner Laboratory Inc., Dept. PVP, Bethesda 14, Md.

GARDNER

Better odorless paints start with

SOVASOL 35

. . . Meets the top standards for the industry!

SOVASOL 35 is an isoparaffinic of the "odorless mineral spirit" class. Its excellent odor characteristics and unusual ability to give false body in paint formulations make it ideal for use in interior protective coatings.

SOVASOL 35 is widely used in the formulation of odorless alkyd-type flats, semi-gloss and certain enamel-type interior paints for trade sales goods, where odorless paint is desired.

It is water white in color and passes all pertinent stability and copper corrosion tests. It is practically odorless, is doctor sweet and is relatively color stable.

For complete information about *Sovasol 35*—and how it can improve *your* products—call your Socony Mobil representative, or write the address below.

SOCONY MOBIL

OIL COMPANY, INC.

26 BROADWAY, NEW YORK 4, N. Y.

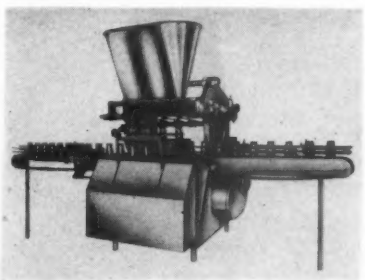
NEW MATERIALS — EQUIPMENT

BURRELL

INSTRUMENT
For Gas Chromatography

"Universal Model K-3 Kromo-Tog" for gas and vapor-phase chromatography is said to offer fast and accurate analysis of gases or liquids, even liquids boiling up to 300° C. Size is 24″ high x 16″ wide x 13″ deep, smaller and more compact than previous models put out by the company.

Typical applications include separation of closely boiling isomers of gas and liquid organic compounds, determination of trace components, rapid routine analysis for a control component, analysis of fractions from organic distillations, analysis of petrochemicals and many different organic liquids. Burrell Corp., Dept. PVP, 2223 Fifth Ave., Pittsburgh 19, Pa.

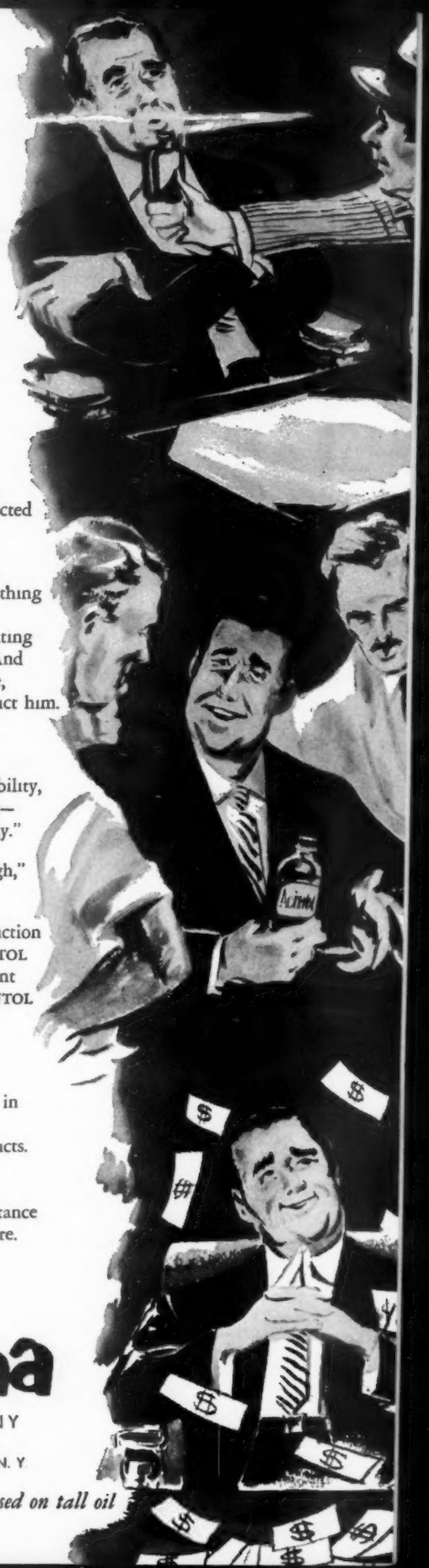


FILLER

FILLING MACHINE
Piston Type

"Model SL55," a straight line filler that is said not to fill unless containers are under the filling nozzle, handles from two ounce to quart and two pound containers, and fills semi-liquids and semi-solids. According to the company, the valve mechanism on the ma-

The man with a nose for profit!



At first, when he started sniffing the air, we thought this manufacturer had detected an off odor in our product.

"No, no, it isn't that," he said when we expressed our puzzlement. "I smell something here, though. You say ACINTOL® FA Fatty Acids are based on a non-fluctuating raw material source?" We affirmed. "And the price is stable. And quite reasonable, I think you said?" We couldn't contradict him.

He sniffed again. "Highly fractionated products, too, what? Low rosin and unsaponifiables? Good color, color stability, and all that? High linoleic acid content—no linolenic? Good odor, too, obviously."

We concurred. "Smell something, though," he said. "Maybe it's money."

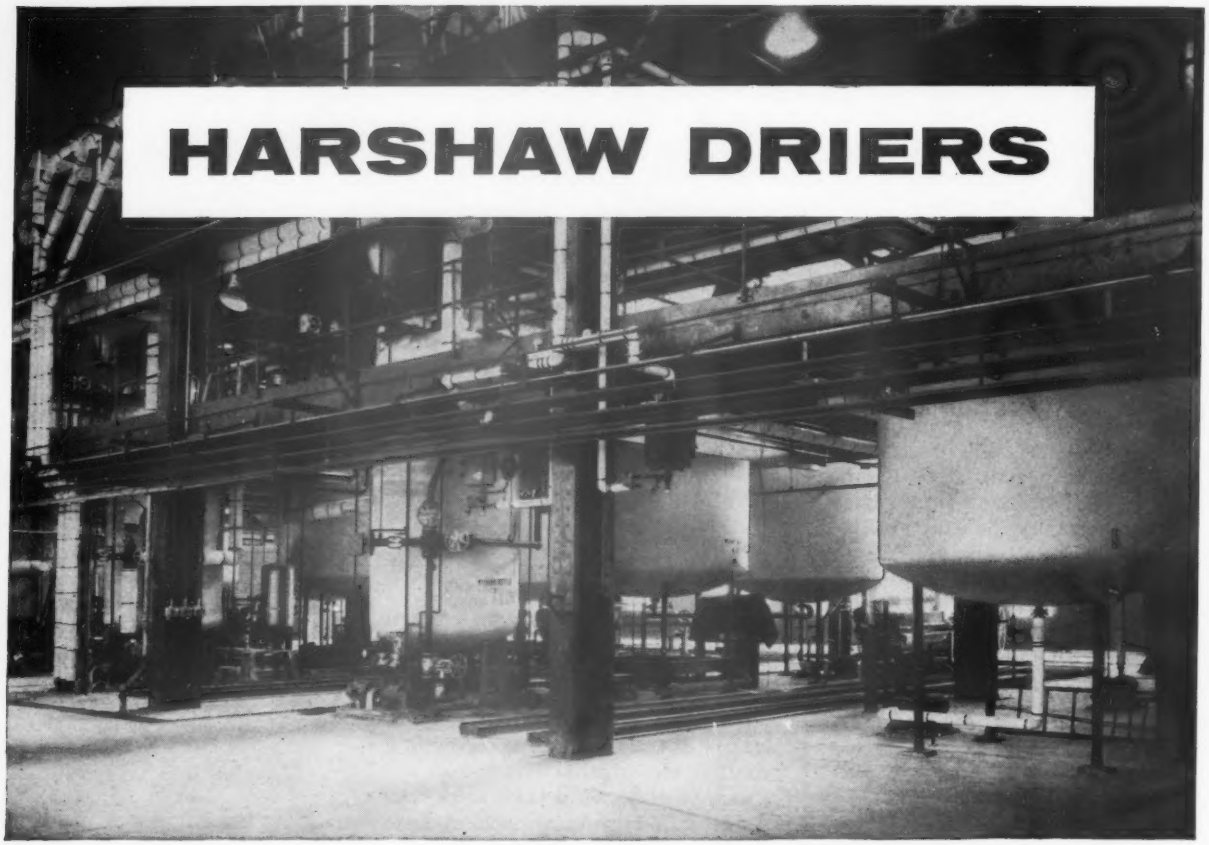
He called in his chief chemist and production superintendent and had them try ACINTOL Fatty Acids in their formulations. It went off so well he's also looking into ACINTOL Distilled Tall Oil. Today he's simply reeking with profit.

Now if you have a nose for economy, too, and won't compromise on quality in your paint and varnish formulations, look into our ACINTOL Tall Oil Products. Whatever you need to help you make a few dollars on ACINTOL — samples, formulation suggestions, technical assistance —we'll be happy to supply in full measure.

Arizona
CHEMICAL COMPANY
(INCORPORATED)
30 Rockefeller Plaza, New York 20, N. Y.

World's largest supplier of chemicals based on tall oil

Modern Equipment Insures Uniform High Quality



Harshaw Driers are produced and tested at our plant in Gloucester City, N. J., where we have the most modern facilities available.

Harshaw's precise manufacturing specifications demand the following tests for every batch of driers produced:

- **Metal content**
- **Specific gravity**
- **Color**
- **Viscosity**
- **Total solids content**
- **Flash point (TCC)**
- **Moisture content**
- **Acid value**
- **Miscibility with raw linseed oil**
- **Miscibility with mineral spirits**
- **Benzene insoluble content**
- **Customer's specified tests**

Order your next requirement of driers from Harshaw. Distribution is nation-wide through 18 stock points.

TYPICAL HARSHAW DRIERS

LIQUID DRIERS

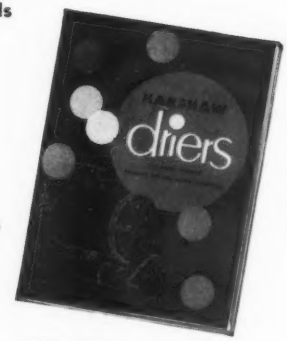
- Uversol (Naphthenate) Liquids
- Linoresinate Liquids
- Linoleate Liquids
- Lithos
- Octasols
- Pastes
- Pastalls

SOLID DRIERS

- Uversol (Naphthenate) Solids
- Linoresinate Solids
- Linoleate Solids
- Soyate Solids
- Fused Resinates

POWDERED DRIERS

- Precipitated Resinates
- Drying Salts:
  - Cobalt
  - Lead
  - Manganese
  - Zinc



WRITE FOR YOUR FREE COPY

This 36-page Drier Book lists the many chemicals available to you from Harshaw. Pictures of plants, warehouses, research and manufacturing operations are scattered throughout the book. We will gladly send you a copy.

THE HARSHAW CHEMICAL COMPANY

Cleveland 6, Ohio

CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HASTINGS-ON-HUDSON, N. Y.
HOUSTON • LOS ANGELES • PHILADELPHIA • PITTSBURGH

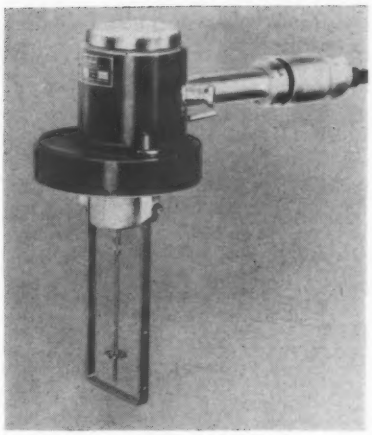
chine is made so that it can be dismantled, cleaned and reassembled quickly. All contact points around the filling zone are made of stainless metal. Speed of fill is from 60 to 88 containers per minute with higher speeds available. The Filler Machine Co., Inc., Dept. PVP, 10 Penn Ave., Rockledge, Philadelphia 11, Pa.

CONTINENTAL CAN

SHIPPING CONTAINER
With Added Protection

A high-bake "Perma-Lined" steel shipping container is said to be especially suited for those products that require permanent lining protection from the metal used in producing the pail. Some of the packer products claimed to be offered greater protection in this new container with its varied linings are paints, printing inks and glues.

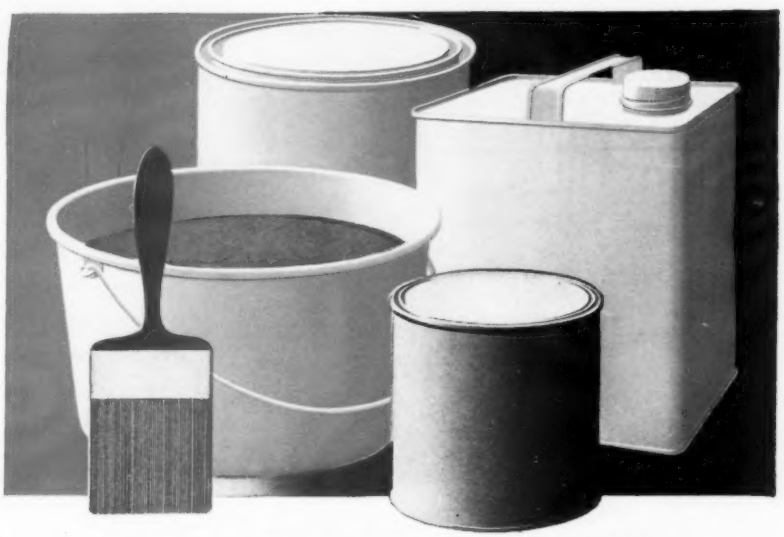
These containers are offered in an open top lug cover style (sizes from 2-gallon through 12-gallon) and a closed head drum style in a 5-gallon size. Company says container structure at the bottom minimizes the double-seam chime opening, permitting the forming of a better inside enamel fillet to protect the critical double-seam area. Welded bail ears, rather than riveted ears, are claimed to allow for a smooth inside surface at this point, again assuring uniform film coverage. Continental Can Co., Dept. PVP, 100 E. 42 St., New York 17, N. Y.



BROOKFIELD

VISCOMETER
Explosion Proof

The new Brookfield explosion proof viscometer, for use by the chemical industry in Class I, Group D locations, has a motor completely encased in a "machined from the solid" aluminum case. All immersable parts are stainless steel. The explosion proof features have been approved by the Underwriters Laboratories for all models. Manufacturer states new model has same accuracy as previous ones. Brookfield Engineering Labs, Inc., Dept. PVP, 200 Porter St., Stoughton, Mass.



For Better Quality Paints Or Varnishes
It Will Pay You To Investigate Neville Resins

Neville manufactures a broad range of coumarone-indene and petroleum resins under such exacting quality control that absolute uniformity in your production is assured. They are inert, add resistance to acids, alkalis, brine and water, and may be cold-blended or cooked with all commonly used drying oils. In the case of aluminum paint, these resins are in high favor since they promote leafing and leaf retention. If you are not already using them, it will pay you to use the coupon below to write for further information.

NEVILLE CHEMICAL COMPANY • PITTSBURGH 25, PA.

NEVILLE

Please send information on Neville Chemicals.

NAME TITLE

COMPANY

ADDRESS

CITY STATE

NC4-PV

Announcing! Increased plant capacity on

Oronite PHTHALIC ANHYDRIDE *plus*

new, large storage terminals at key national consuming points

Oronite was the original producer of phthalic anhydride from ortho-xylene, a petroleum derivative. Having complete control of the basic raw material, you are always assured of Oronite as a dependable source of supply.

With increasing demands for Oronite PA, manufacturing facilities have been greatly enlarged to assure you product when you need it. And to further provide you quick delivery of phthalic anhydride in molten or flake form, Oronite has set up bulk storage terminals in close-by Eastern centers. Carload prices are obtainable in mixed carloads of phthalic anhydride, maleic anhydride and new isophthalic.

Why not get Oronite's new, up to the minute story on phthalic anhydride? Call or write the nearest Oronite office.

"Basic Chemicals for Industry"

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES: 200 Bush Street, San Francisco 20, California

SALES OFFICES

30 Rockefeller Plaza, New York 20, N. Y. Carew Tower, Cincinnati 2, Ohio
20 North Wacker Drive, Chicago 6, Illinois 714 West Olympic Blvd., Los Angeles 15, Calif.
Mercantile Securities Building, Dallas 1, Texas 450 Mission Street, San Francisco 5, Calif.
36 Avenue William-Favre, Geneva, Switzerland

ORONITE CHEMICAL COMPANY

3864

PERSONNEL CHANGES

PITT. COKE & CHEMICAL

James F. Hall, Jr. has been appointed company representative for industrial chemical sales in the Chicago area, with offices at 75 Wacker Drive. Mr. Hall joined the company in 1953 as a sales trainee. For the past two years, he has been a sales representative for the plasticizer division. He is a member of the American Institute of Chemical Engineers, the Society of Plastics Engineers, and the Society of the Plastics Industry, Inc.

J. F. Hall, Jr.

NATIONAL ANILINE

William Howlett Gardner has been appointed manager of chemical literature, according to an announcement by H. J. Daigneault, vice president.

Dr. Gardner will be responsible for the preparation and coordination of all technical literature on chemical intermediates produced by the company. He is an active member of many scientific and technical societies, and has been associated with National Aniline since 1943.

WITCO CHEMICAL

Ralph F. Anschuetz, a sales representative who covered Michigan, part of Chicago, Iowa, and St. Louis, for the Witco Chemical Co. during the past 17 years, died May 29. He was a member of the executive committee of the Chicago Rubber Group and was active in their golf committee for many years. Mr. Anschuetz was also an experienced football official in the Big 10 Conference.

MAUTZ PAINT and VARNISH

Richard Moore has been appointed technical director and **Milton A. Thompson** assistant production manager, it was announced by William Hallman, vice president in charge of production.

Mr. Moore was formerly formulator and production manager of the Elliott Paint and Varnish Co., Chicago. He was also paint formulator for the Truscon Laboratories of Detroit.

Mr. Thompson was sales engineer for industrial paints for Jay Kay Paint Mfg. Co. of Texas before joining the Mautz company.

DU PONT

The following organizational changes in the sales and manufacturing divisions of the pigments department have been announced:

Dr. Donald B. Killian has been appointed sales manager for white pigments, replacing **Roy E. Troutman** who is on leave of absence for reasons of health.

Dr. Edwin A. Gee, manager of the plants technical section in the manufacturing division has been appointed sales manager of pigment colors in place of Dr. Killian.

C. Ivey Smith, Jr., technical superintendent at the Newport, Del., plant for titanium metal, will replace Dr. Gee. Mr. Smith's post will be taken by **D. W. Smith,** a technical supervisor at the Newport plant.

WOBURN CHEMICAL

Ralph B. Huber, sales engineer, has been appointed New England representative.

Mr. Huber, who maintains offices at 216 Tremont St., Boston 16, Mass., will handle Woburn's complete line of fatty acids and synthetic drying oils. He will cover these markets for Woburn products with the assistance of Messrs. **Robert Bennink, Edgar W. Everts** and **William H. Huber, Jr.**

ADELPHI PAINT & COLOR

Edgar A. Carr and **Ben C. Murphy** have been added to the sales force, it was announced by Bernard N. Cullen, sales and advertising manager. Mr. Carr will call on dealer trade in southern Ohio, while Mr. Murphy will call on dealer trade in West Virginia.

Wouldn't You Like Your Paras and Toluidines in 25 lb. Bags?

OLD WAY OR THIS...

HERE ARE FOUR GOOD REASONS WHY.

This new packaging procedure:

1. SAVES WEIGHING
2. SAVES STORAGE SPACE
3. REDUCES SPILLAGE
4. LESSENS DUSTING

and all this, at no additional cost to you

REDS NOW PACKAGED IN 25 POUND UNITS

PARA REDS		TOLUIDINE REDS	
No. 1667	Para, Ex. Light, Toluidine Shade	No. 1077-S	Toluidine, Ex. Ex. Light, Very Best Gloss
No. 1000	Para, Light	No. 1077	Toluidine, Light
No. 1650	Para, Medium	No. 968-F	Toluidine, Non-Haze
No. 1670	Para, Dark	No. 1073	Toluidine, Medium
No. 1605	Para, Dark	No. 1078	Toluidine, Dark
No. 1606	Para, Dark, Extra Soft		

Kentucky Color
AND CHEMICAL COMPANY, INC.
Louisville 12, Kentucky

1. Please call on us and discuss Kentucky Colors in 25 lb. units _____
2. Please match enclosed envelope sample (or color chip) _____

NAME _____
COMPANY _____
STREET _____
CITY _____ STATE _____

DOW

YOU KNOW DOW DELIVERS THE FINEST LATEX . . .

Do you know Dow offers these important extras?

Years of experience as the largest producer of STYRENE BUTADIENE latex for paint enable Dow to provide unique service and assistance. These can contribute to better manufacturing, quality products and bigger, more profitable sales.

Research and development laboratories at Dow are the most complete of their kind. Here experienced specialists cooperate with the personnel of Dow customers to improve the high quality of the finished products.

Shipping points are conveniently provided by widely separated plants to assure "on time" delivery with low freight costs. Dow STYRENE BUTADIENE latex is produced in Michigan, Texas and Canada, with a new plant in California to be completed this year.

Advertising and promotion to consumers, dealers and the professional painting market are powerful, year-'round activities at Dow. Dow advertising in leading publications furnishes appealing themes to be incorporated into promotions of customers for Dow STYRENE BUTADIENE latex.

For discussion and further information, contact your nearest Dow Sales Office or THE DOW CHEMICAL COMPANY, Plastics Sales Dept. PL564E Midland, Michigan.

you can depend on
DOW PLASTICS

LATEX T.M.

DOW

W. M. Gearhart

R. B. Herring

EASTMAN CHEMICAL

Dr. J. E. Magoffin, sales manager for the chemical division, has announced the creation of a new chemical sales development section which will be separate from the commercial sales department.

William M. Gearhart, formerly chief chemist in charge of the service and development laboratories of the company at Kingsport, Tenn., has been appointed manager of the new section. **R. B. Herring,** who had served as assistant to Mr. Gearhart, has been promoted to fill the position as chief chemist in charge of the laboratories, which will continue under Mr. Gearhart's supervision.

MACBETH

Warren B. Reese has been appointed vice president, it was announced by Norman Macbeth, president of the corporation and its subsidiaries. Mr. Reese, formerly general sales manager, will continue to direct sales from his new position. The company manufactures industrial color control illumination and electronic instruments.

W. B. Reese

JONES & LAUGHLIN

J. H. McCorkle, manager of the Port Arthur, Texas plant, has been appointed manager of both the New Orleans and Port Arthur plants.

Richard C. Reed, Jr., a salesman in the New Orleans plant, has been appointed district sales manager of the New Orleans district.

RHEEM MANUFACTURING

William R. Dickinson has been appointed resident representative for "Rheemcote" steel drums and pails, according to an announcement made by A. W. Nides, sales manager, central region. The appointment represents a new expansion in the company's activities in Kansas, Iowa, Nebraska and South Dakota.

Mr. Dickinson is relocating in Kansas City, after having been with the container division in Chicago.

J. M. LEHMANN

C. B. Hoffman, formerly sales manager, has been elected vice president. He will continue in charge of sales. Before coming to Lehmann, Mr. Hoffman operated a consulting engineering business in Baltimore.

CROWN CORK & SEAL

James F. O'Neill has been appointed sales representative in the New York district for the can division, it was announced by Robert J. Seibert, northeast area sales manager for the division.

Mr. O'Neill joined the company in 1954 as a sales trainee, later serving as assistant area sales manager. He will now make his headquarters at Crown Cork & Seal's New York office, 60 E. 42 St.

ARTHUR D. LITTLE

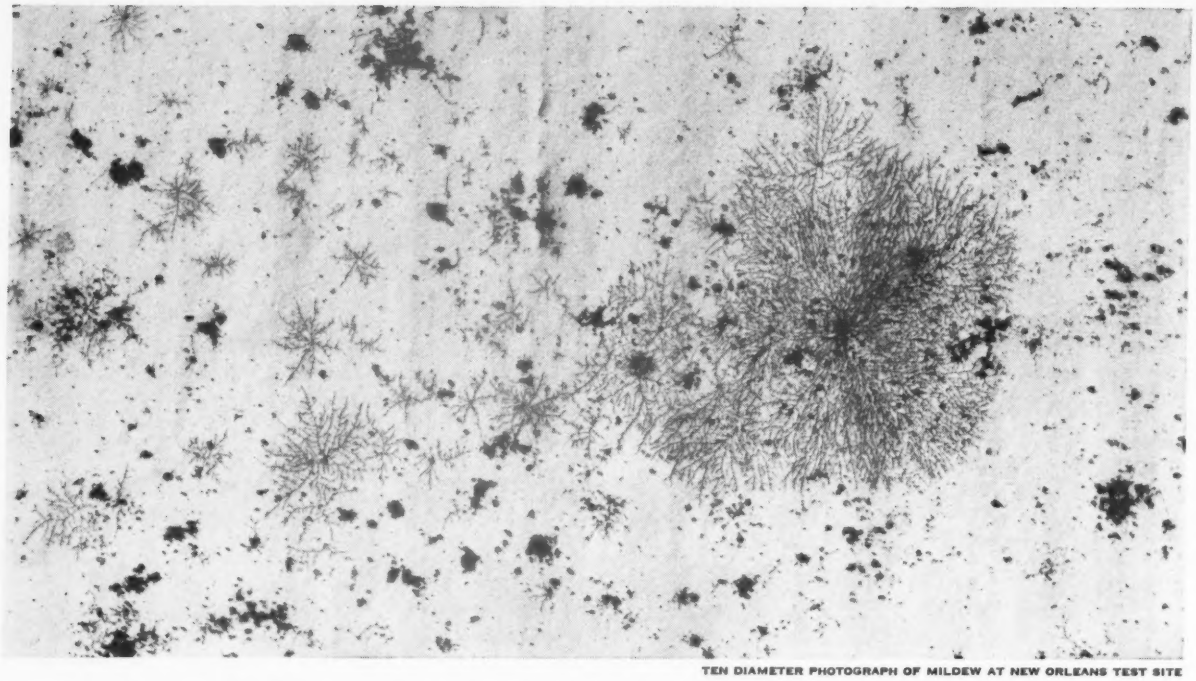
Dr. Howard O. McMahon, science director, has been elected vice president of the company, it was announced by Raymond Stevens, president. Dr. McMahon holds two nationally recognized awards which testify to his scientific achievements. The Franklin Institute presented him with the Edward Longstreth Medal in 1951 for his contributions to the development of the helium cryostat (an apparatus for liquefying helium that is standard equipment for low temperature laboratories around the world). In 1952 the American Ceramics Society honored him with the Frank Forrest Award for his work in the field of thermal radiation from heated glasses.

This guaranteed paint deodorant has *proved* its complete effectiveness in thousands of gallons of paint, varnish, enamel, lacquer thinners and other similar types of products.

- **Maskit #2 makes your paint *preferred* by painters, home owners, industry and institutional men.**
- **It masks the odor in the can while paint is being applied — during — and after — the drying period.**
- **It does not affect drying time or color durability.**

Amazingly economical, 1 lb. of Maskit #2 deodorizes 150 gallons of paint. Why not order a trial pound today and make your own tests! $1.50 lb.

AROMATIC PRODUCTS, Incorporated
235 Fourth Avenue, New York 3
CHICAGO • DALLAS • MEMPHIS • PITTSBURGH • LOS ANGELES • BOSTON



TEN DIAMETER PHOTOGRAPH OF MILDEW AT NEW ORLEANS TEST SITE

HAVING MILDEW PROBLEMS?

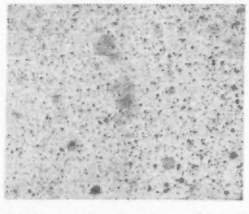
Then, formulate with

EAGLE-PICHER
Leaded Zinc Oxide

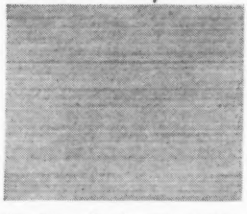
WITH EAGLE-PICHER LEADED ZINC OXIDE in your house paint formulation, you can provide improved resistance to mildew. Yes, scientific tests prove that house paints formulated with Eagle-Picher Leaded Zinc Oxide not only resist mildew discoloration but offer far superior decorative value and longer life at low cost.

HERE'S PROOF OF MILDEW RESISTANCE IN HOUSE PAINTS!

Tests made at Eagle-Picher Test Farm, New Orleans, La.



Mildew discoloration after 5 months vertical south exposure, without Eagle-Picher Leaded Zinc Oxide. (No fungicide used.)



No mildew after 5 months vertical south exposure, with paint* made from Eagle-Picher Leaded Zinc Oxide. (No fungicide used.)

***Formulation of Leaded Zinc Oxide Paint Used in Test**

Pigment—62.2%		Vehicle—37.8%	
E-P #356 Leaded ZnO	50.0%	Raw Linseed Oil	60.5%
TiO_2—Anatase	15.0	Z-3 Linseed Oil	19.5
Magnesium Silicate	35.0	Mineral Spirits	18.2
	100.0%	24% Pb	1.3
		6% Co	.5
			100.0%

PVC—32.0%

Since 1843

EAGLE PICHER

THE EAGLE-PICHER COMPANY

Largest Producer of Both Zinc and Lead Pigments

General Offices: Cincinnati 1, Ohio

Regional Sales Offices: Chicago, Cleveland, Dallas, New York, Philadelphia, Pittsburgh

AMSCO

Karl F. Giloth has been elected assistant vice president and **Marc A. Law, Jr.** was elected assistant secretary and assistant treasurer of the company, it was announced by A. W. Vallentyne, chairman of the board.

K. F. Giloth

Mr. Giloth will continue his responsibilities as midwest sales manager for the territory extending from Pennsylvania west to the Rocky Mountains. He joined Amsco in 1936. As assistant vice president and midwest sales manager he will supervise sales of petroleum solvents, technical naphthas and waxes in that area.

Mr. Law joined the company in 1946. He became manager of the Chicago order department and later was appointed office manager in Chicago. As assistant secretary and assistant treasurer he will continue in his capacity as office manager and head of the Chicago order department.

BETTER FINISHES

Kenneth A. Proctor has been appointed industrial sales manager, Better Finishes and Coatings, Inc., with headquarters at the company's plant in Newark, N.J., according to an announcement by Myron F. Bryant, president.

K. A. Proctor

Mr. Proctor will be in charge of industrial sales of plastics coatings, strip coatings and industrial finishes. For several years prior to joining Better Finishes he headed his own firm of manufacturers representatives in the Philadelphia area and was previously associated with the Steelcote Manufacturing Co. as sales manager of maintenance paints.

MERRITT-CHAPMAN & SCOTT

Charles W. Niederauer has been appointed methods and planning advisor for the chemical, paint and metallurgical department. The department is comprised of Devoe & Raynolds Co., Inc., of Louisville, Ky., and Tennessee Products & Chemical Corp., of Nashville, Tenn.

In his new post, Mr. Niederauer will be responsible for analyzing and advising with respect to the overall methods of operations of Tennessee and Devoe. He will be headquartered in the Nashville general offices of Tennessee Products & Chemical Corp.

RHODIA

Rhodia, Inc., New York, has announced the appointment of **Comerciale Reka S. A.** as sales and technical representative for synthetic aromatic chemicals and compounds and "Alamask" industrial reodorants in Mexico, with offices in Mexico City. Also announced was the appointment of **Luis Felipe,** Havana, as sales and technical representative for these products in Cuba.

ALKYDOL LABORATORIES

Dr. Joseph Matt has been appointed director of research. Previously with Armour and Co., and Virginia-Carolina Chemical Corp., Dr. Matt has been mainly interested in fluorination, organophosphorus compounds, fatty acid derivatives, and high polymers.

JAMES BUTE PAINT

Harold N. McCann has been made trade sales manager it was announced by Loren B. Odell, president. McCann has served as sales manager for several months and through his efforts, a new line of paint was successfully introduced in the six state Bute Co. territory.

McCann was formerly with the Reardon Co. as a factory representative. He joined Bute as promotion and advertising manager.

RHEEM MANUFACTURING

R. L. "Bob" Worrell has been appointed sales representative for the entire line of steel pails, it was announced by A. W. Nides, sales manager of the Chicago region. He will service the St. Louis area.

A new cyclic polyol
METHYL GLUCOSIDE
SYNTHETIC DRYING OILS
VARNISHES
TALL OIL ESTERS
SYNTHETIC RESINS
SURFACE ACTIVE AGENTS
MODIFIED ALKYDS
FATTY ACID ESTERS
PLASTICIZERS
ARGO® BRAND Methyl Glucoside is white, crystalline, and non-hygroscopic. It is now available in 100-lb., multiwall paper bags.
Samples and technical literature are available upon request.
ARGO®
CORN PRODUCTS REFINING COMPANY
Chemical Division
17 Battery Place, New York 4, N. Y.

Knox Price

Earl Hanson

HEYDEN CHEMICAL

Knox Price has been appointed western regional sales manager and **T. M. O'Neil,** vice president in charge of marketing. Mr. Price also will continue as west coast sales manager of Nuodex Products Co., a division of Heyden, a position he has held since 1951.

Earl Hanson has been appointed western regional representative to assist Mr. Price on both Heyden and Nuodex activities.

Mr. Price was vice president and general manager of Atlas Paint and Varnish Co. from 1947 to 1951 and assistant manager from 1945 to 1947. From 1934 to 1945 he was associated with American Marine Paint, Varnish and Lacquer Co. in San Francisco.

Mr. Hanson has been a technical service representative for the C. K. Williams Co. since 1950. Previously he was associated with Pacific Coast Paint and Varnish Co. and the Andrew Brown Paint Co. in various capacities related to research development and technical service work.

NATIONAL LEAD

Harry E. Bodine has been appointed manager of the St. Louis branch paint division succeeding **Ellis E. Bussee,** who has resigned to enter the private banking field. Mr. Bodine joined the company in 1931. He was appointed assistant manager of white lead sales for the St. Louis branch in 1948 and trade sales manager, paint division, in 1950.

Gordon F. Frey succeeds Mr. Bodine as trade sales manager of the St. Louis branch paint division. He has been trade sales manager of the Boston branch paint division since 1954.

Ben L. di Pietra becomes trade sales manager of the Boston branch paint division. He was first employed by the company in 1953 as a salesman for the Philadelphia branch.

John J. Mason has been appointed trade sales manager of the paint division of the Cincinnati branch. He started his career with the company in 1945 as a clerk in the Chicago branch, was appointed supervisor of the bookkeeping department there in 1948, and in 1952 was transferred to the sales department of the branch.

REICHHOLD CHEMICALS

L. C. "Chris" Brandt has been named general manager of the new plant currently being established in Kansas City, Kansas.

A veteran of seventeen years with RCI, Mr. Brandt was first with the sales service laboratories in Ferndale, Mich., and later with the chemical color pigment plant in Brooklyn, N. Y. Most recently he has been in charge of sales in the Kansas area.

ACHESON COLLOIDS

Theron T. Chapel has been appointed product control supervisor, and **James S. Crowl** supervisor of process research. Mr. Crowl is replacing **Erwin J. Campbell** who has now been named product development supervisor.

Mr. Chapel's industrial experience includes adhesive-development research for the Minnesota Mining & Manufacturing Co. and chemical engineering in the research and development division of the Armour Laboratories.

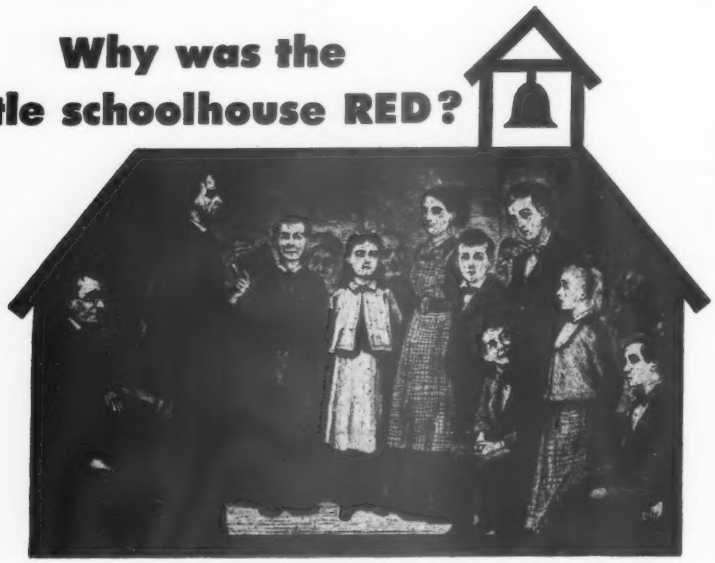
Mr. Crowl has been employed by the General American Transportation Corp. for several years.

GLIDDEN

D. W. Eugene has been appointed manager of national trade sales maintenance for the paint division, it was announced by A. D. Duncan, vice president and general manager of the division.

In his new position, Mr. Eugene will be responsible for paint sales in the fields of plant and institutional maintenance, contract painting and architecture. He will also work with regional directors and trade sales managers in

Why was the little schoolhouse RED?



AT THE turn of the century "the little red schoolhouse" was a familiar sight in the land. Because money came hard, these little frame structures were painted only infrequently. To protect their exteriors from the ravages of the elements, paints containing weather-resistant red iron oxide were used—the iron oxide lending its color as well as its durable protectiveness.

REICHARD-COULSTON produced much of the rich, red iron oxides which went into those long-lasting "little red schoolhouse" paints.

During our 101-year history, REICHARD-COULSTON has kept pace with the technical advances in the paint industry. Part of the results of this continued growth are REICHARD-COULSTON IROX and SOFTEX synthetic reds. These synthetic red oxides are valued for their color softness, fine particle size and exceptionally rich color. Manufacturers prefer them for enamels, latex emulsions, ranch red house paints, alkyd flats and all finishes requiring high tinting strength pigments.

Find out how REICHARD-COULSTON colors such as IROX and SOFTEX reds can help *your* production. For free laboratory samples and technical data, write today.

Natural IRON OXIDE PIGMENTS *Synthetic*

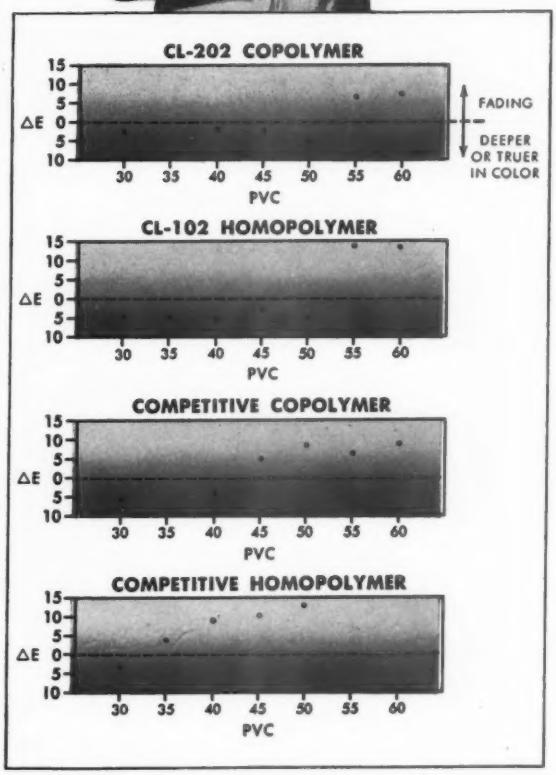
Reichard-Coulston, Inc.

15 EAST 26th STREET, NEW YORK 10, N. Y.

Warehouses in principal cities. Factory: Bethlehem, Pa. Over a century of manufacturing and service.

accelerated weathering tests prove:

CELANESE PVAc EMULSIONS GIVE YOU SUPERIOR TINT RETENTION



EXTERIOR DURABILITY. The above diagram illustrates the variations in tint retention obtained on identical paints formulated with fine vs. coarser particle size emulsions. These test paints, ranging in PVC from 30-60%, were made from a master pigment paste dispersion and let back with the test emulsions. The finished paints were tinted to a medium blue with an aqueous phthalocyanine blue dispersion and applied over asbestos cement panels. After Weatherometer exposure, the tri-stimulus value ΔE was plotted for each PVC. The value ΔE is the closest numerical representation of the color change apparent to the eye.

A study of the charts shows that *fine particle size* emulsions can be formulated at higher PVC's without sacrificing tint retention. The Critical PVC of both Celanese PVAc emulsions was greater than 50% . . . *higher than any emulsion tested!*

Fine particle size is the key to the superior tint retention of exterior polyvinyl acetate paints based on Celanese Homopolymer and Copolymer emulsions!

These facts were borne out in Weatherometer Tests on exterior PVAc paints ranging in PVC from 30-60%. All paints were identical in formulation except for the emulsion used.

Fading at low PVC's occurred in those paints formulated with ordinary *coarser particle size* emulsions after as little as 600 hours Weatherometer exposure. These same paints formulated with Celanese *uniformly fine particle size* emulsions showed *no evidence of fading* at PVC's up to 50%.

Tint retention and high pigment binding are just two reasons why Celanese CL-102 Homopolymer and CL-202 Copolymer emulsions are your best buy in formulating quality, low-cost vinyl paints. Just check these facts about Celanese PVAc emulsions:

- **Can be formulated at PVC's approaching those of alkyd flats**
- **Extremely fine particle size**
- **Crystal-clear, water-resistant films**
- **Superior freeze-thaw stability**
- **Tough, flexible, weather-resistant films**
- **Superior low-temperature film coalescence—even below 40° F.**
- **Excellent mechanical stability; can even be milled**
- **Superior wetting ability—an extra margin of safety against flocculation difficulties**

A Celanese technical representative will be happy to discuss these characteristics with you and assist in your formulations. Send for our brochure containing technical bulletins on the new homopolymer CL-102 and Celanese copolymer emulsion CL-202. Along with it you'll receive a manual of standard laboratory tests by which you can determine the properties of any resin emulsion vehicle. Just fill out and mail coupon below.

Celanese Corporation of America, Plastics Division,
Box 165-G Ferry Street, Newark 5, New Jersey

☐ Please send me brochure on Celanese PVAc paint emulsions CL-102 and CL-202, including test manual.

Please send me samples of:
☐ CL-102 Celanese Homopolymer PVAc emulsion.
☐ CL-202 Celanese Copolymer PVAc emulsion.

NAME_____

TITLE_____ COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Celanese
plastics and resins

Celanese®

CELITE diatomite pigments diffuse light and control reflection

Photomicrograph shows Celite's innumerable irregular shapes which scatter light to control sheen.

A soft uniform flatness, even at low angles, is the beautiful result of formulating interior paints with Celite*. By forming a rich textured film that diffuses rather than reflects light, these microscopic particles assure an attractive flat appearance indefinitely. The surface never rubs up shiny. These same irregular particles also impart "tooth" to the film for strong, lasting adhesion to any surface.

Celite is diatomite, an extremely tough form of amorphous silica, that reinforces the paint film. And, the micro-porosity imparted by Celite checks blistering and peeling by aiding the escape of moisture vapor from unpainted plaster.

If you're concerned about low angle sheen, find out how Celite can give you complete control of this problem. Write for further information to Johns-Manville, Box 60, New York 16, N. Y. In Canada, 565 Lakeshore Rd. E., Port Credit, Ont.

JOHNS-MANVILLE JM PRODUCTS

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

Johns-Manville CELITE THE EXTENDER PIGMENTS FOR ALL COATINGS

the organization of maintenance personnel expansion and in the development of sales training programs.

George J. Seith has been appointed regional director of the Mississippi region with headquarters in St. Louis, it was announced by Mr. Duncan.

His appointment fills a vacancy caused by the recent death of **Fred B. Wickham** who served as regional director for eight years.

In his new position, Mr. Seith will direct all company paint operations in an area comprised of Missouri, Arkansas, Oklahoma, Kansas and Colorado together with parts of Mississippi, Tennessee, Kentucky, Indiana, Wyoming and Illinois. He will have managerial responsibility for paint production facilities, industrial and trade sales and service activities, and dealer and company branch operations.

BAKER CASTOR OIL

Eric G. Orling, president, has announced the following appointments:

J. W. Hayes has been appointed sales manager, and is in charge of the over-all sales activities of the company. He joined the company's technical service department in 1946, and was transferred to the executive sales department in 1950.

L. J. Jubanowsky has been appointed eastern sales manager, responsible for sales in the area east of the Rocky Mountains. Mr. Jubanowsky joined Baker's technical service department in 1942. Since 1950 he has been active as technical sales representative in the general New York area.

R. L. Vignolo is Pacific Coast sales manager in charge of sales activities west of the Rocky Mountains. He has been actively in charge of sales on the west coast since 1950. His headquarters are at the company's offices in Los Angeles.

R. E. Rulison is district sales manager in the general Chicago area, and makes his headquarters at the company's offices in Chicago. Mr. Rulison has been with the company in various capacities since 1941.

HERCULES POWDER

James R. Addonizio, has been appointed technical sales representative in the New York office of the synthetics department, it was announced by James W. L. Monkman, the department's director of sales.

Mr. Addonizio had extensive production, research, and sales experience in the chemical industry before joining the company in January. For the past several months, he has been undergoing an intensive Hercules sales-training course at the company's research center and the home office in Wilmington, Del.

AMERICAN CAN

Dr. Kenneth W. Brighton, former associate director of the research division, has been appointed general manager of the new products department, it was announced by William C. Stolk, president.

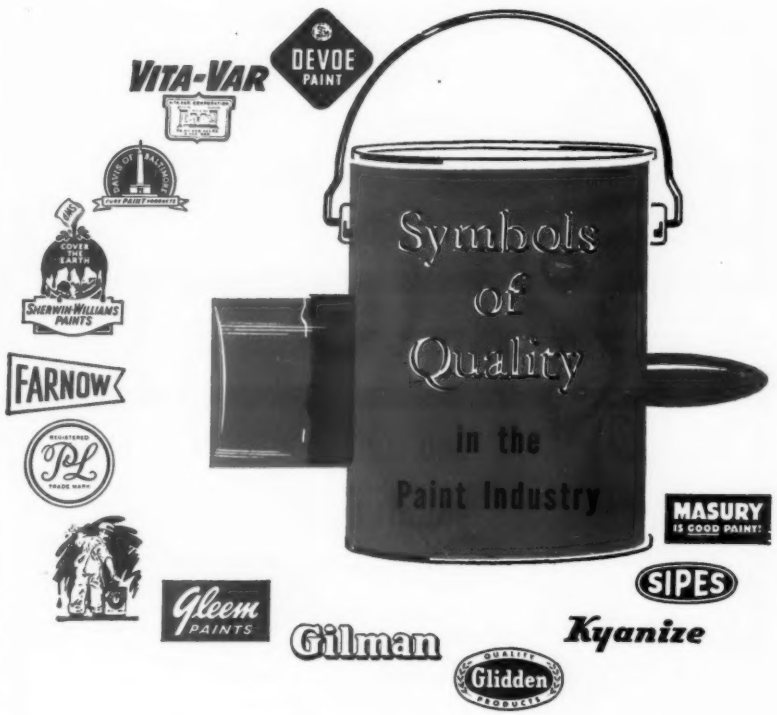
Dr. Brighton joined Canco as a technologist in 1936 and has held a number of research positions since that time. In 1951 he was named associate director of research at the Maywood, Ill. laboratories and in 1955 assumed the same duties at the company's Barrington, Ill. research center.

Expansion of the company's general sales department to include a special non-food container division "to take full advantage of the present and future growth opportunities in non-food can sales" has been announced by **Edward K. Walsh,** newly-appointed general manager in charge of the firm's nationwide sales organization.

William F. May, who has held a number of managerial posts in the research and manufacturing departments, has been appointed general manager in charge of the non-food division that handles the sales of cans for paint, aerosol products, detergents, motor oil, etc.

SHERWIN-WILLIAMS

Robert T. Gabbert has been named technical manager of the government bid sales department, it was announced by Harold E. Spitzer, director of development. Mr. Gabbert will make his headquarters at the company's Chicago laboratories. He joined the firm in 1949.



LEADERS of the American paint industry, like those represented above, supply a constantly increasing amount of *alkyd resin* paints for industry and home. These paints grow in popularity each year because they provide unusual durability, color retention, and adhesion—as well as easy brushing and fast drying.

Dependable supplies of uniform quality phthalic anhydride play an important part in alkyd resin paint production. That's why Pittsburgh Coke & Chemical is a key supplier for so many paint manufacturers.

As a *basic* producer, Pittsburgh can assure them (1) Reliable supplies from an integrated plant and (2) Assured purity, low color value and low maleic anhydride content, thanks to Pittsburgh quality control from coal to finished phthalic anhydride. Let us show you how you may be able to benefit from these advantages, too!

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Water-Soluble Casein

U. S. Patent 2,744,891. David F. Waugh, Watertown, Mass., assignor to National Dairy Research Laboratories, Inc., Oakdale, N. Y., a corporation of Delaware.

A process for isolating a water-soluble alkali metal caseinate from skim milk which comprises adjusting the calcium concentration of the milk to within the range from 0.05 to 0.1 molar at a temperature below about 60° C. in order to displace the ionic calcium-casein equilibrium to induce ionic calcium association of casein micelles to a water-nondispersible stage, separating calcium caseinate therefrom, and treating the calcium caseinate with a calcium sequestering agent to substitute an alkali metal for ionic calcium associated with the casein and reduce the casein calcium content to below 0.2%, based on the dry weight of the casein, and displace the ionic calcium-casein equilibrium to dissociate the ionic calcium-associated casein micelles to a water-soluble stage, the said substitution being carried out in an aqueous medium while maintaining the pH within the range from about 5.3 to about 6.5.

DICALITE 4200

and comes out
BRIGHT and CLEAR
Many varnish manufacturers first tried Dicalite 4200 for varnish filtration because it was (and is) the fastest flow-rate filteraid available. But they continue to use Dicalite 4200 because it gives excellent clarity. And when you get the clarity you want and fast throughput for maximum production, both in the same filteraid—well, that's a combination that's hard to beat! Write for information on how Dicalite 4200 can help your varnish production.
Dependable
GLC
GREAT LAKES
Dicalite®
DIATOMACEOUS MATERIALS
DICALITE DIVISION: GREAT LAKES CARBON CORP., 612 S. FLOWER ST., LOS ANGELES 17, CALIF.

Vinyl Ester Copolymers

U. S. Patent 2,740,771. Raymond I. Longley, Jr., and Earl C. Chapin, Springfield, and Richard F. Smith, Ludlow, Mass., assignors to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A copolymer of a vinyl ester of an aliphatic unsubstituted acid containing from 1 to 20 carbon atoms and 2-butene-1, 4-diol, said copolymer containing from 1 to 15% hydroxyl groups by weight.

Oxidized Wax Composition

U. S. Patent 2,746,876. Ivor W. Mills, Glenolden, Pa., assignor to Sun Oil Company, Philadelphia, Pa., a corporation of New Jersey.

A composition comprising an oxidized microcrystalline petroleum wax having a saponification value of at least 30 and a penetration less than 15 at 77° F., and having incorporated therein colloidal hydrophobic silica of particle size less than 0.1 micron in minor amount sufficient to substantially reduce the penetration.

Petroleum Microcrystalline Wax Coating Composition

U. S. Patent 2,748,013. William B. Watson, Park Forest, Ill., assignor to Sinclair Refining Company, New York, N. Y., a corporation of Maine.

A coating composition which essentially comprises an air-blown mixture of an aromatic petroleum oil and about 3 to 50 weight per cent of a petroleum microcrystalline wax.

Stain Filler Combination for Wood

U. S. Patent 2,746,873. John W. Mayers, Grosse Ile, Mich., assignor to Chadeloid Corporation, Dayton, Ohio, a corporation of Delaware.

A wood staining and filling composition consisting essentially of the following ingredients in substantially the proportions given:

	Parts by weight
Gum accroides red	4.0
Tetrahydrofurfuryl alcohol	8.0
Calcium carbonate	30.0
Wood flour	3.0
Burnt umber	1.0
Toluol	15.0
Methanol	5.0
Activated charcoal	2.0
Carbon black	1.0

and 4 parts by weight of dye solution consisting essentially of:

	Parts by weight
Buffalo Black	0.5
Brilliant Croceine 3 BA	2.8
Metaline Yellow	1.7
Tetrahydrofurfuryl alcohol	50.0

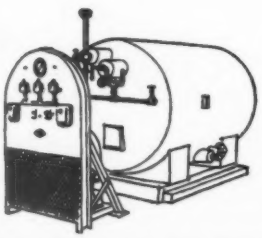
"LIQUIFLOW* assures us of Quality Esterification"

reports JOHN F. BENNETT, Chief Engineer
CAROLINA OIL PRODUCTS, INC.
Severn, North Carolina,
... producers of quality Tall Oil Esters and Processed Fish Oil Products.

Mr. Bennett goes on to say, "CO_2, as supplied by our LIQUIFLOW* system, furnishes the ideal inert atmosphere for water removal during esterification reaction. Efficient water removal is, of course, vital in all esterification reactions—including alkyd resins, fatty acid esters, rosin esters or varnish made insitu —to prevent reverse reaction.

"CO_2 sparging is also the surest means of insuring a good, stable color in our product at all times. In addition, CO_2 used as an atmospheric 'blanket' in kettles and thinning tanks is the finest possible insurance against fire and flash hazard.

"Quality is very important in our products—and we depend upon our LIQUIFLOW* CO_2 system to give us the highest possible product quality and quality control."



* **LIQUIFLOW CO_2 SYSTEM**
Manufactured by The Liquid Carbonic Corporation. This unit assures a constant supply of chemically pure CO_2 anywhere in your plant.

LIKE THE FULL FACTS? SIMPLY MAIL THE COUPON BELOW

World's Largest Producer of
THE LIQUID CARBONIC CORPORATION

FREE TECHNICAL BULLETIN
Gives complete data on how CO_2 is helping the paint and varnish industry improve product quality and reduce operating costs. Send for your copy today.

THE LIQUID CARBONIC CORPORATION
3128 South Kedzie Avenue, Chicago 23, Illinois

Please send me your technical bulletin on the uses of CO_2 in the paint and varnish industry.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

all over America it's . . .

PVO for Paint & Varnish Oils

see your local PVO representative for information

SAFFLOWER
LINSEED
TUNG
SOYA
OITICICA
CASTOR
FISH

62 Townsend Street
San Francisco 7, Calif.

1 ATLANTA, GEORGIA
G. R. Nottingham Co.

2 BOSTON, MASSACHUSETTS
R. B. Huber, Sales Engineer

3 CHICAGO, ILLINOIS
Daniel G. Hereley Co.

4 CLEVELAND, OHIO
Donald McKay Smith Company

5 DALLAS, TEXAS
W. W. Richerson Company

6 DETROIT, MICHIGAN
George E. Moser & Son, Inc.

7 HOUSTON, TEXAS
Texas Solvents & Chemicals Co.

8 KANSAS CITY, MISSOURI
Ack Sales Company

9 LOS ANGELES, CALIFORNIA
Pacific Vegetable Oil Corp.

10 LOUISVILLE, KENTUCKY
B. H. Boyet & Company

11 MILWAUKEE, WISCONSIN
J. W. Copps

12 MINNEAPOLIS, MINNESOTA
Horton-Earl Co.

13 MONTREAL, CANADA
B. & S. H. Thompson & Company, Ltd.

14 NEW YORK, NEW YORK
Pacific Vegetable Oil Corp.

15 PHILADELPHIA, PENNSYLVANIA
Baker Industrial Oils Co.

16 SAN FRANCISCO, CALIFORNIA
Pacific Vegetable Oil Corp.

17 SEATTLE, WASHINGTON
W. Ronald Benson, Inc.

18 ST. LOUIS, MISSOURI
Ivan T. Bauman Co.

19 TORONTO, CANADA
B. & S. H. Thompson & Company, Ltd.

Modified Polyvinyl Acetal Resins

U. S. Patent 2,746,945. Francis T. Buckley, Ludlow, Mass., assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A composition of matter comprising a polyvinyl butyraldehyde resin, a plasticizer, 0.10 part of paratertiary amyl phenol per 100 parts of resin and 2.0 parts of triphenyl fluorosilane per 100 parts of resin.

Water Dispersible Titanium Dioxide Pigment

U. S. Patent 2,744,029. Franklin L. Kingsbury, New Brunswick, N. J., assignor to National Lead Company, New York, N. Y., a corporation of New Jersey.

In a process for making a water dispersible titanium dioxide pigment material from a calcined titanium dioxide hydrate in which the titanium dioxide pigment material is calcined and wet milled the steps of: flocculating the calcined wet milled pigment material in the presence of a volatile organic flocculating agent comprising a carboxylic acid selected from the group consisting of formic acid, and acetic acid to produce a titanium dioxide flocculent; heating said flocculent to a temperature from about 110° C. to about 180° C. to dry said flocculent and simultaneously volatilize and remove any traces of said organic flocculating agent therefrom; and then milling said dried flocculent to produce a water dispersible titanium dioxide pigment material.

Coating Composition

U. S. Patent 2,745,758. Allan B. Ruddle, deceased, late of San Francisco, Calif., by Beatrice M. Ruddle, executrix, San Francisco, Calif.

A coating composition comprising the emulsified product resulting from the admixture of a first mixture of gilsonite in a mineral oil, the approximate relative proportions of said constituents being 15 grams of gilsonite and 40 cc. of a mineral oil, with approximately 50 cc. of a second mixture comprising the following constituents in the indicated relative proportions:

Water	gallons	1
Aluminum sulphate	ounces	1-10
Sodium fluosilicate	do	1-10
Sodium silicate	gallons	2-20

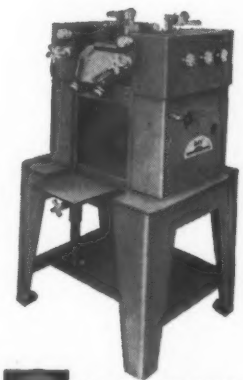
said amount of said second mixture having incorporated therein after formulation approximately 2 grams of sodium fluosilicate, said emulsified product having the property of being able to form a satisfactory coating film for wood and metal surfaces upon being diluted with a compatible thinner.

DAY 5 x 12 MILL

allows you to make more profit on short orders. Features include:

- **Rugged heavy duty construction**
- **Feed hoppers**
- **Day Hydra-Set as optional equipment**

increase your profits three ways



DAY 4 x 8 LAB MILL

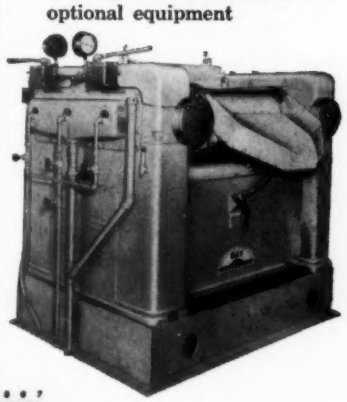
saves time because you get the answers quickly and accurately. Features include:

- **Either fixed or floating roll operation**
- **Quick release handwheel adjustments**
- **Floor or bench model**

DAY PRODUCTION MILL

saves time and money by virtually eliminating "downtime", because of precision engineered, rugged construction.

- **Available in 10 x 22 and 14 x 30 sizes**
- **All standard production mills are readily converted to either fixed or floating roll operation**
- **Day Hydra-Set available as optional equipment**



in mixing equipment **DAY** *means longer life span*

THE J. H. DAY COMPANY

4932 BEECH ST., NORWOOD, CINCINNATI 12, OHIO
Division of Cleveland Automatic Machine Company

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario

Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5—D.F.

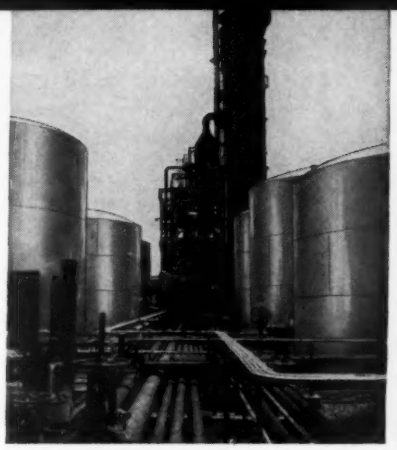
New Unitol
UNITOL ROS
UNITOL ACD
UNION BAG IS INDUSTRY'S
ONLY "SINGLE SOURCE" FOR
Tall Oil Rosin
Tall Oil Fatty Acids
Refined Tall Oil
Distilled Tall Oils
Crude Tall Oil
Tall Oil Pitch
unitol
TRADE MARK
UNION
TALL OIL PRODUCTS
Chemical Sales
UNION BAG & PAPER CORPORATION
WOOLWORTH BUILDING, NEW YORK 7, N. Y.

With completion of new fractional distillation plant at Savannah, Union Bag becomes first manufacturer to produce and sell all basic tall oil products.

Products

(Tall Oil Rosin)

(Tall Oil Fatty Acids)



ALUMINUM STORAGE TANKS are used to produce and maintain product with outstanding color characteristics. Miles of aluminum and stainless steel piping serve the operation and inventory.

The most modern tall oil distillation plant in the world is now in operation in Savannah, Georgia.

The popular *Unitol* line has been expanded to include the complete group of tall oil distillation products manufactured in this new Union Bag plant. Union now is the only single source for all basic tall oil products: rosin, fatty acid, refined oil, distilled oil, crude oil, and pitch.

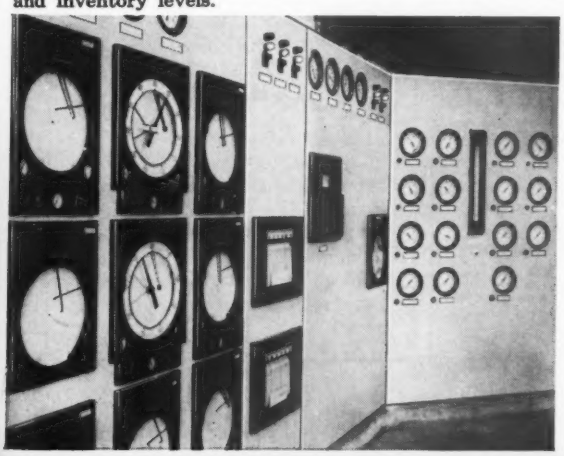
Demand for *Unitol* products is at an all-time high. The pine wood derivatives obtained in the Kraft paper manufacturing process are being used increasingly in protective coatings, soaps and cleaners, linoleum, textiles, adhesives, disinfectants, fungicides, emulsions, paper sizes and water-proofing agents.

Potentially, *Unitol* tall oil products have broad application wherever fatty acid and (or) rosin are employed.

Unitol ROS (tall oil rosin) and *Unitol ACD* (tall oil fatty acid) guarantee the user an outstanding competitive position. In color, odor, uniformity, and all other characteristics, *Unitol* products are outstanding examples of the high standard of development of the American chemical industry.

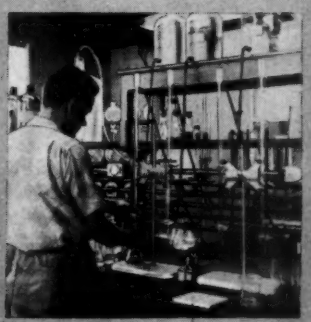
FOR INFORMATION ABOUT UNITOL TALL OIL PRODUCTS
write Chemical Sales, Union Bag & Paper Corporation, Woolworth Building, New York 7, N. Y.

INSTRUMENT PANEL for automatic control at both processing and inventory levels.



QUALITY CONTROL LABORATORY MEANS BETTER UNITOL PRODUCTS FOR YOU

PALEST ROSIN YET. Technician compares rosin control cube with color standards.



HIGH FATTY ACID PURITY requires constant check, such as acid titration.

UNITOL PRODUCTS IN READY SUPPLY

SPECIALLY LINED *Unitol* **TANK CARS** guard against impurities, discoloration.

UNITOL ROS is packaged and shipped in standard rosin container.

Foils, Coatings From Mixtures of Pastes of Vinyl Chloride Polymers

U. S. Patent 2,748,095. August Kling, Mannheim, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany.

A composition for the production of foils and coatings comprising a pulverulent linear vinyl chloride polymer containing a preponderate proportion of vinyl chloride dispersed in a plasticizer therefor, the ingredients of the dispersion being present in amounts such that the dispersion is a paste at atmospheric temperature, and an aqueous paraffin wax emulsion dispersed therein in an amount providing a paraffin wax content of about 1% to 10% by weight of the amount of said polymer and plasticizer, said emulsion having a liquid content such that the resulting dispersion is a paste at atmospheric temperature.

Lacquers From Naphthalene-Formaldehyde Resins

U. S. Patent 2,748,094. Hans Krzikalla, Heidelberg, and Frederic van Taack-Trakranen, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany.

A lacquer from a naphthalene-formaldehyde resin which yields coatings being elastic after drying comprising a solution of a naphthalene-formaldehyde resin containing less than 5% of oxygen and a substantially non-volatile, highly chlorinated paraffin with a chlorine content of 20% to 70% in an organic solvent, the proportion of the naphthalene-formaldehyde resin to the said chlorinated paraffin being of the order of 100 parts to from 5 to 30 parts.

Composition and Method For Extending Drying Oils

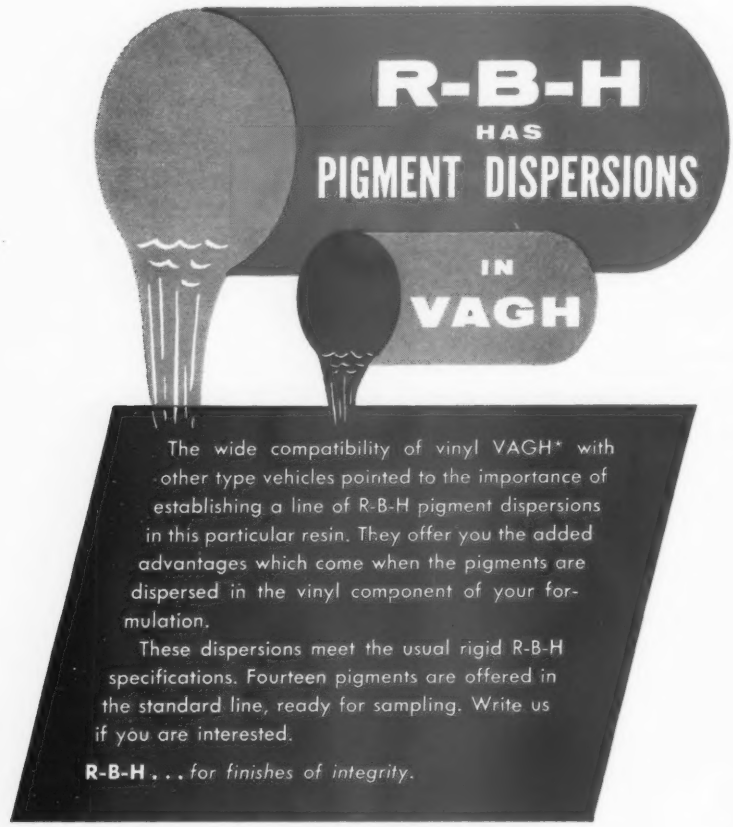
U. S. Patent 2,748,011. Marion W Pickell, Oklahoma City, Okla., assignor to Kerr-McGee Oil Industries, Inc., a corporation of Delaware.

A composition comprising a fatty drying oil and from 20 to 60 percent by weight of an essentially asphaltene-free resin-oil fraction of a bituminous material.

Phosphor Coating Composition

U. S. Patent 2,744,072. George Meister, Newark, N. J., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania.

A coating composition for applying luminescent materials to vitreous surfaces comprising a phosphor suspended in a liquid vehicle, said liquid vehicle comprising methyl cellulose, water, a completely water soluble mono-hydroxy alcohol having a boiling point below that of water and an alkalizing-dispersing agent selected from the group consisting of ammonium hydroxide and a water soluble amine whose boiling point is below that of water, the pH of said composition not exceeding 12, the percentage by weight of said methyl cellulose to said phosphor being from 1 to 3, said phosphor being suspended in said liquid vehicle in the proportions of from 0.25 to 0.5 gram per cubic centimeter, the percentage by volume of said alkalizing-dispersing agent to said vehicle being from 3 to 10, the percentage by volume of said flow agent to said vehicle being not less than 30, and the proportions of said flow agent and water in said composition being such that the viscosity of said composition at 20° C. falls within the range of 100 to 200 cps.


R-B-H
HAS
PIGMENT DISPERSIONS
IN
VAGH
The wide compatibility of vinyl VAGH* with other type vehicles pointed to the importance of establishing a line of R-B-H pigment dispersions in this particular resin. They offer you the added advantages which come when the pigments are dispersed in the vinyl component of your formulation.
These dispersions meet the usual rigid R-B-H specifications. Fourteen pigments are offered in the standard line, ready for sampling. Write us if you are interested.
R-B-H . . . for finishes of integrity.

*Product of Bakelite Company, a unit of Carbide & Carbon Corporation.

R-B-H Dispersions

DIVISION OF INTERCHEMICAL CORPORATION
DISPERSION TECHNICIANS
BOUND BROOK, NEW JERSEY

Pigment dispersions in nitrocellulose; ethyl cellulose; urea formaldehyde; vinyl and alkyd resins; chlorinated rubber and other plastic binders.

R-B-H IS A TRADEMARK OF INTERCHEMICAL CORPORATION

LANCASTER, ALLWINE & ROMMEL
REGISTERED PATENT ATTORNEYS

•

Suite 424, 815 — 15th St., N. W.
Washington 5, D. C.
Patent Practice before U. S. Patent Office. Validity and Infringements Investigations and Opinions.
Booklet and form "Evidence of Conception" forwarded upon request.

NEWS

Canco Plans Nation-Wide Plant Equipment Program

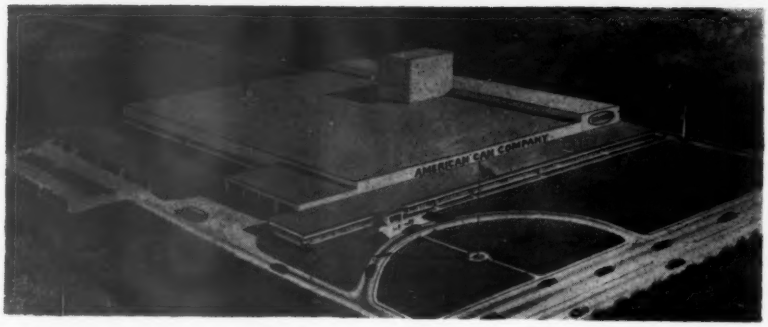
American Can Co. has appropriated $27,000,000 for installation of new manufacturing facilities as a first step in combating rising tin and steel plate prices, it has been announced by William C. Stolk, president of the container firm.

The company will install extensive new equipment and plant facilities at various points in the U. S. to process tin and steel plate from continuous strips, he explained. This, to a major extent, will eliminate the use of pre-cut sheets which Canco, along with the rest of the can industry, has been using up to now, he added.

"This development means that we will take plate from the steel companies in huge coils before it has been inspected, chemically treated or cut into sheets," Mr. Stolk said. "We will perform these operations in our own plants, instead of having the steel mills perform them at their cost plus a profit."

He said that among the initial steps in the two-year program will be construction of a large new plate processing plant to be built in the Chicago area.

Mr. Stolk added that additions for installing plate processing equipment will be constructed at Canco's Oakland, Cal. and Tampa, Fla. plants. Plate processing facilities also will be installed in the New York metropolitan area, Baltimore, Los Angeles, Texas and a number of other locations, he said.



Architect's drawing of the plant soon to be constructed in the Chicago area.

Hercules Movie on PE

A new movie, "The Little Steps" which portrays the many research and production steps taken to make Hercules pentaerythritol a major material of commerce, is now available from Hercules Powder Co., Wilmington 99, Del.

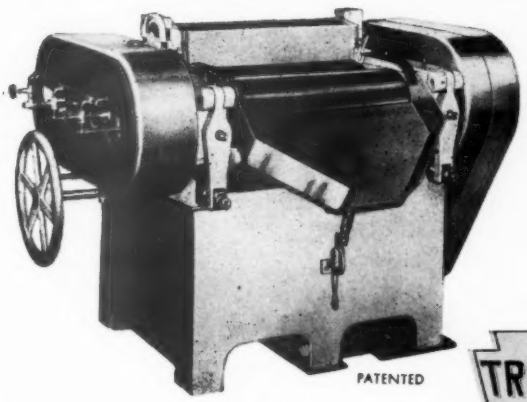
Recent major industry developments such as the introduction of nondusting PE by Hercules are included in the film which is a 15-minute 16-mm., sound-and-color motion picture.

Amsco Baltimore Office

The opening of American Mineral Spirits Company's new Baltimore sales office and solvents and chemicals terminal was announced last month by E. M. Toby, Jr., president.

Located at 1500 Carbon Ave., Baltimore 26, Md., Amsco's new facilities are under the supervision of Donald J. McIntyre.

Lease your TROY ROLLER MILL Now



TROY

One Point Adjustment "Floating Roll" Principle

HIGH SPEED — Precision Controlled Dispersion

PROCESS MACHINERY DIVISION REPRESENTATIVES

BOSTON, MASS.
R. T. Forbes Co.
BUFFALO, NEW YORK
Commercial Chemicals, Inc.
CHICAGO, ILL.
C. M. Baldwin
CINCINNATI, OHIO
Palmer Supplies Co.
CLEVELAND, OHIO
P. S. Equipment Co.
DALLAS, TEXAS
Roy A. Ribelin Distributing Co.
DETROIT, MICHIGAN
J. W. Stark Co.
DENVER, COLORADO
L. H. Herr Co.
HOUSTON, TEXAS
Roy A. Ribelin Distributing Co.
LOS ANGELES, CALIF.
L. H. Butcher Co.
MEMPHIS, TENN.
Robert F. Sheahan Co.
NEW ORLEANS, LA.
Breffeilh & Sheahan
NEW YORK CITY
Phone: Troy, Pa. 32
ORLANDO, FLORIDA
Palmer Supplies Co. of Florida
PHILADELPHIA, PENNA.
T. J. Rudolph
PHILADELPHIA, PENNA.
(D. C., Va., Md., Del.)
W. J. Grant Co.
PITTSBURGH, PENNA.
Nelson Engineering Sales Co.
PORTLAND, OREGON
L. H. Butcher Co.
ROCHESTER, N. Y.
Commercial Chemicals, Inc.
SALT LAKE CITY, UTAH
L. H. Butcher Co.
SAN FRANCISCO, CALIF.
L. H. Butcher Co.
SEATTLE, WASHINGTON
L. H. Butcher Co.

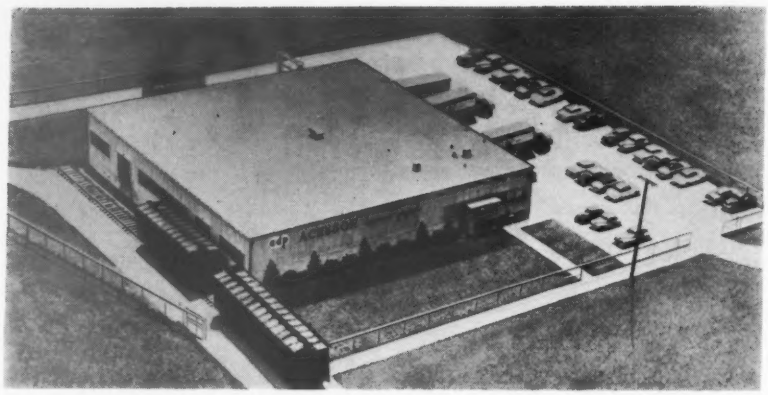
TROY ENGINE & MACHINE CO.
Troy, Pennsylvania Telephone: Troy 32

NEWS

Plant Nears Completion

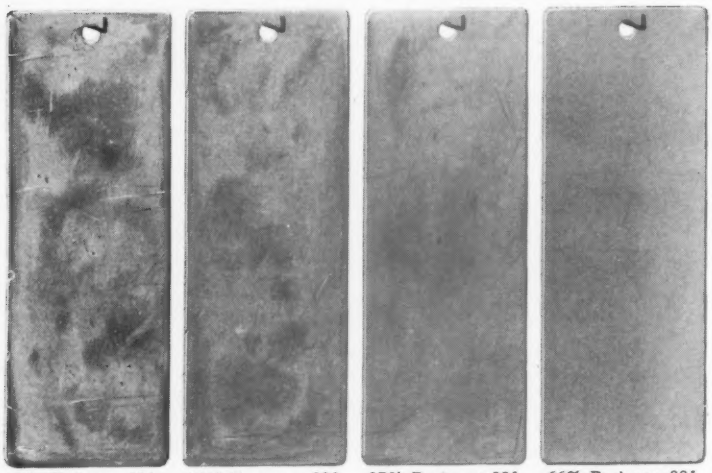
The Cadar Paint Corp. has announced the near completion of its new plant at 2700 Annapolis Rd., Baltimore 30, Md.

Charles E. Caltrider, vice president, will head the marketing of the "Cadar" line of paints, varnishes, enamels, and industrial finishes. John M. Rayfield, who has a wide background in paint technology, will head both the technical and production departments.



AERIAL VIEW of Acheson Dispersed Pigment Company's new Orange, Texas plant, considered to be one of the most modern facilities in the world for dispersed pigment manufacture. Economies afforded by process improvements here are a contributing factor in ADP's major downward price change for pigment dispersions used as colorants in the manufacture of such important plastics as polyvinyl chloride, vinyl copolymers and polystyrene.

melamine improves color and gloss retention of automotive paints!



No Resimene 881 *20% Resimene 881* *27% Resimene 881* *66% Resimene 881*

Test panels demonstrate how Monsanto Resimene* 881 upgrades basic alkyd formulations

A camera has recorded the evidence. When test panels finished with different baked-on formulations were exposed for one year at a 45° South angle in Southern Florida, all formulations containing melamine proved more weather-worthy. The higher the melamine content, the better was the resistance to chalking and retention of color and gloss.

Panels were finished in accordance with standard finishing techniques. The melamine resin used was Monsanto Resimene 881—especially designed to have wide compatibility with all types of alkyds from short oil to very long oil. Its characteristics assure a film with outstanding initial gloss and gloss retention.

For almost 10 years Monsanto research has been developing resins which can improve the performance of surface coatings. You are invited to write for data sheets and additional information on the complete Monsanto line of melamine and urea resins, styrene latices and resins, and phenolic resins and thickening agents for all aqueous systems. Address Monsanto Chemical Company, Plastics Division, Room 805 Springfield 2, Mass.

MONSANTO

*Resimene: Reg. U.S. Pat. Off.

Form Soybean Council

Organization of the Soybean Council of America, nationwide non-profit commodity group for the soybean industry, was completed in Chicago last month with the election of officers from a joint committee of the American Soybean Association and the National Soybean Processors Association, the founding organizations.

First officers of the new Council are: President—Howard L. Roach, Plainfield, Iowa; Vice President—David G. Wing, Mechanicsburg, Ohio; Secretary—R. G. Houghtlin, Chicago; Treasurer—Albert Dimond, Lovington, Ill.; Executive Director—George M. Strayer, Hudson, Iowa. The new organization is designed to do the promotional, educational and research work both domestic and foreign which faces the soybean industry

Appoint Sales Agents

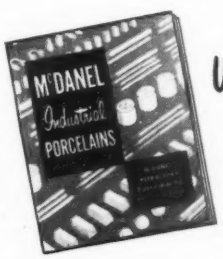
The Calvert-Mount Winans Co., Baltimore, Md., manufacturers of PVA emulsions, PVA composite vehicles, polyesters, and alkyd resins, has appointed the following sales agents:

T. C. Ashley & Co., Boston, Mass., who will cover New England; S. S. Skelton Co., Inc., Cleveland, Ohio, who will cover northern Ohio, Buffalo, and Detroit; B. H. Roettker & Co., Cincinnati, Ohio, who will cover southern Ohio and Indiana; J. W. Copps, Inc., Milwaukee, Wis., who will cover Wisconsin; Donald R. Fitzgerald, Chicago, Ill., and B. H. Boyet & Co., Louisville, Ky.

McDANEL

BRINGS YOU A *New* CERAMIC LABORATORY MILL JAR!

● Here is the new, 1-gallon McDanel Laboratory Mill Jar (PRJ-1G). It has been designed with recessed bronze hardware to prevent catching or holding on roller-type mills. This new McDanel Jar has a smooth, long-wearing, high-grade ceramic body . . . can be easily and quickly cleaned, inside and out. The close-fitting cover rests on a soft rubber gasket and can be tightened by hand without cracking or damaging the cover. There is no leakage. Neoprene gaskets should be used for oil base grinding. Investigate the McDanel PRJ-1G Laboratory Mill Jar now.



Write for Your McDanel Industrial Ceramic Catalog TODAY! Gives complete information on Balls, Mill Lining, Mill Jars, Jar Mills, Special Ceramics, etc.

McDANEL *Industrial* PORCELAINS

McDANEL

REFRACTORY PORCELAIN COMPANY

BEAVER FALLS · PENNSYLVANIA

NEWS

Proposed Merger Nears

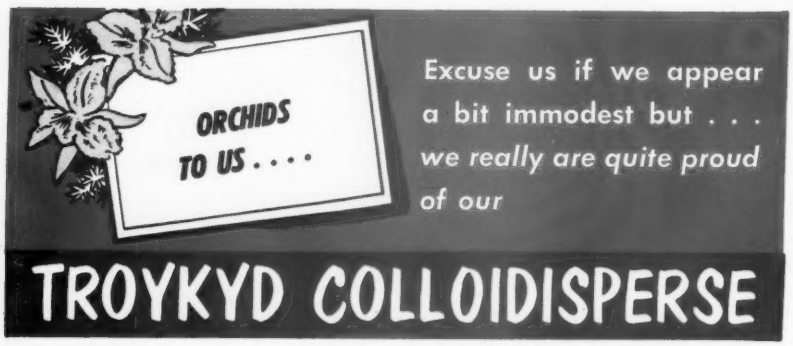
The proposed merger of Catalin Corporation of America and Reichhold Chemicals, Inc., came a step closer when Harry Krehbiel, presient of Catalin, reported favorably to his directors following a nationwide tour of RCI's major plants.

The directors of the two companies have agreed on merger terms, but stockholders of neither have voted on the move as yet.

Celanese Fellowships

Celanese Corporation of America has announced the establishment of graduate fellowships in 13 universities in its continuing program to assist and encourage development of deserving graduate students for scientific careers.

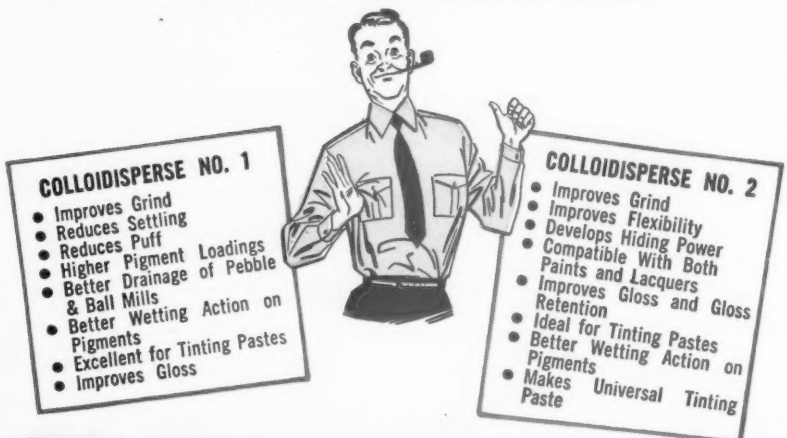
Participating institutions are: Cornell University, Georgia Institute of Technology, University of Illinois, Louisiana State University, Lowell Technological Institute, McGill University, North Carolina State College, University of Oklahoma, Princeton University, The Rice Institute, University of Texas, University of Maryland and Yale University.



Last year we offered our Colloidisperses to the trade. For a typical reaction we quote the production manager of a large paint company.

"Colloidisperse is great. Many of our production headaches disappeared when we used it in our formulations. Our paint production is now much faster and better."

Many other favorable reports, like the above, have made us justifiably proud of our product. Why don't you try it? Write now for samples and more information!


COLLOIDISPERSE NO. 1
• Improves Grind
• Reduces Settling
• Reduces Puff
• Higher Pigment Loadings
• Better Drainage of Pebble & Ball Mills
• Better Wetting Action on Pigments
• Excellent for Tinting Pastes
• Improves Gloss
COLLOIDISPERSE NO. 2
• Improves Grind
• Improves Flexibility
• Develops Hiding Power
• Compatible With Both Paints and Lacquers
• Improves Gloss and Gloss Retention
• Ideal for Tinting Pastes
• Better Wetting Action on Pigments
• Makes Universal Tinting Paste

TROY CHEMICAL COMPANY
2589 Frisby Avenue • New York 61, N. Y.

F. H. Eberman of A-D-M Honored on Retirement

More than half a century has passed since Fred H. Eberman, an energetic young man with a talent for story telling, began his first job in the paint business.

E. H. Eberman

Recently, Mr. Eberman—still energetic, but with a larger repertoire of stories—retired as regional sales manager of the Archer-Daniels-Midland Co. Over 100 friends gathered at a special luncheon at Cleveland's Lake Shore Hotel to honor him for his 52-year career in the paint industry. He was presented an inscribed silver tray in recognition of his service. In addition, the guests gave him a Stereo-Realist camera, complete with flash attachment, viewer, special lenses, and light meter.

Mr. Eberman is a member of the 50 year club of the National Paint, Varnish and Lacquer Association and has been voted an honorary membership in the Cleveland Paint and Varnish Production Club.

•

"Teglac" Discontinued

Effective June 30, the plastics and resins division of the American Cyanamid Co. discontinued the manufacture of "Teglac" resins. Sales of these resins have consistently declined and it was no longer feasible to continue their manufacture, according to the company.

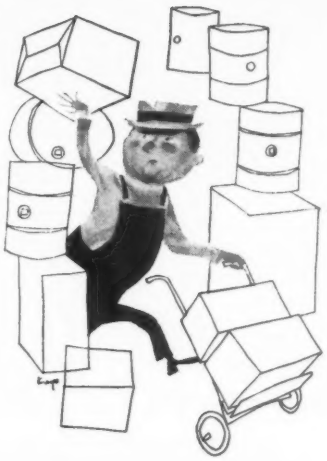
•

New Southern Club Section

The fifth section of the Southern Paint and Varnish Production Club, the Central Florida Section, was formed recently by Southern Club members who live in the Florida area covered by Gainesville, Orlando, St. Petersburg, and Tampa.

At first meeting of the new section Parker Layman, president of the Southern Club, appointed Walter Groves, of Harris Standard Paint Co., as section chairman. Al Hendry, of Tampa Paint and Varnish Co., was named vice chairman. Bill Dodds, of Archer-Daniels-Midland Co., spoke on "Modern Paint Vehicles."

HOW TO SAVE MONEY



Relieve warehouse overload.

Combined orders can cut costs.

Reduce paperwork—one shipment, one order, one invoice.

BUYING SOLVENTS AND CHEMICALS

Fast action—one day service.

Products of the nation's leading producers.

***Products of the* SOLVENTS *and* CHEMICALS GROUP**

Aliphatic Petroleum Naphthas
Alcohols and Acetates
Alkanolamines
Aromatic Solvents, Petroleum and Coal Tar
Chlorinated Paraffins
Chlorinated Solvents
Dresinates
Gylcols and Gylcol Ethers
Ketones and Ethers
Oils and Fatty Acids
Plasticizers
Rosin
Stearates
Terpene Solvents
Waxes

IN DRUM, TANK-WAGON, TRANSPORT AND TANK CAR FROM 15 SERVICE LOCATIONS

SC Solvents Chemicals Group Member

THE SOLVENTS AND CHEMICALS GROUP

2540 WEST FLOURNOY STREET, CHICAGO 12, ILLINOIS

Bulk Plants and Warehouses

Buffalo, Bedford 1572
Chicago, SEeley 3-0505
Cincinnati, ELmhurst 1-4700
Cleveland, CLearwater 2-1100
Dallas, Federal 5428
Detroit, WAlnut 1-6350
Fort Wayne, Anthony 0213
Grand Rapids, CHerry 5-9111
Houston, ORchard 2-6683
Indianapolis, MElrose 8-1361
Kansas City, CHestnut 1-3223
Louisville, EMerson 8-5828
Milwaukee, GReenfield 6-2630
New Orleans, VErnon 3-4646
St. Louis, GArfield 1-3495
Toledo, Jordan 0761
Windsor, CLearwater 2-0933

NEWS

Prepare Flame-Resistant Resins With THPC

Flame- and glow-resistant resins for consumer goods and industrial uses can be made by substituting tetrakis (hydroxymethyl) phosphonium chloride for the compounds commonly used to polymerize phenols, amines, and carboxylic acids, it was recently reported by two Agriculture Department researches. Materials of these groups are widely used for the preparation of resins for the manufacture of molded objects, paints, and other products, but one of the disadvantages for many purposes has been the fact that the resulting "plastics" will burn.

Research on the polymerization of various compounds with tetrakis (hydroxymethyl) phosphonium chloride, frequently abbreviated "THPC", was carried out at the Southern Utilization Research Branch of the Agricultural Research Service, USDA, by Wilson A. Reeves and John D. Guthrie. THPC, which has been found quite effective as a flame-retardant treatment for cotton, also gave satisfactory results when substituted for the usual polymerizing agents in the preparation of resins, and imparted desirable flame-resistant qualities to the products.

Reactions of THPC with cetylamine, urea, melamine, ethylenimine, phenol, phloroglucinol, and chlorendic anhydride are reported, and the chemistry and results of the reactions discussed, in "Intermediate for Flame-Resistant Polymers," published in *Industrial and Engineering Chemistry* for January, 1956. Reprints of the paper may be obtained without cost by writing the Southern Utilization Research Branch, 1100 Robt. E. Lee Blvd., New Orleans 19, La.

•

14,000,000 Gallons Yearly

It has been estimated by Federal officials that the new U. S. highway program will require at least 14,000,000 gallons of paint per year.

Frederick O'Brien Co. Bought by O'Brien Corp.

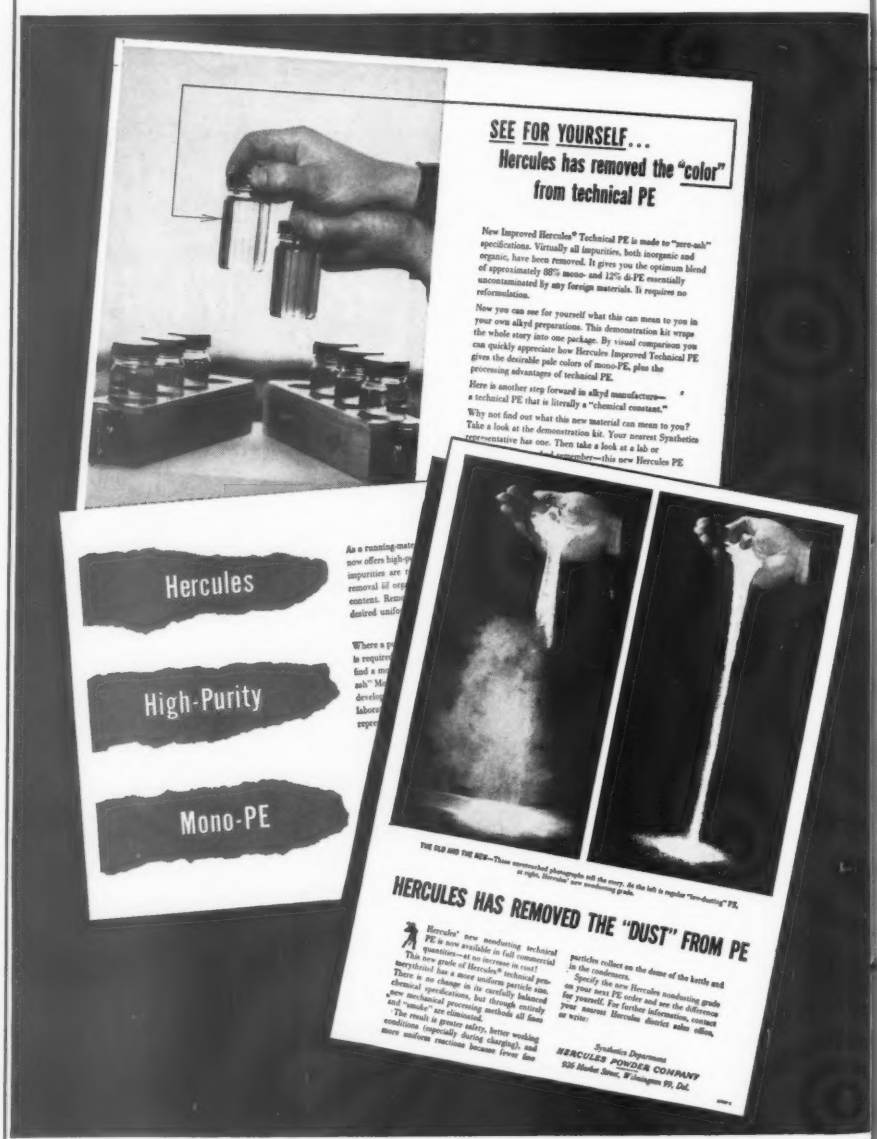
The O'Brien Corp. South Bend, Ind., has purchased the Frederick O'Brien Co. of Los Angeles, Cal., paint manufacturer, Jerome J. Crowley, Jr., president of the South Bend corporation has announced.

Mr. Crowley said that the purchase involved the paint making facilities, warehousing, distribution and accounts receivable of the Frederick O'Brien Co. It will be a wholly owned subsidiary of the South Bend corporation and will be called the O'Brien Paint Company of Los Angeles.

Norman J. Hartzer will continue as general manager of the new branch operation. He has been in this capacity for the past ten years.

Frederick O'Brien was one of the five sons of Patrick O'Brien, who founded the parent company. In 1917, Frederick established a Los Angeles company under his own name but remained a stockholder and director of the South Bend firm until his death in 1955. The subsequent purchase was made from his heirs.

The Los Angeles plant produces a complete line of trade and industrial products. It is particularly noted for the development of an acrylic outside housepaint especially for use in Southern climates.



A completely intergrated paint line will be sold and promoted throughout the southern parts of California and Nevada and in Arizona.

•

McCloskey Buys Tank Truck

To save on delivery costs of varnishes and paint vehicles to its industrial customers in the Philadelphia area, McCloskey Varnish Co. has purchased a tank truck for its Philadelphia plant, it was announced by Frank C. Peck, vice president.

Already in use at McCloskey's Los Angeles and Portland, plants, tank trucks eliminate the cost of filling and emptying the conventional 55-gallon drums.

Glycerine Awards Open

The Glycerine Producers' Association has announced that the fifth annual Glycerine Research Awards are now open and that nomination blanks are available. The awards are granted for independent research leading to new and improved applications of glycerine or glycerine derivative to products or processes.

Copies of the bulletin giving complete details on the awards may be obtained from the Glycerine Producers' Association, 295 Madison Ave., New York 17, N. Y.

•

Wins Goodyear Medal

Dr. Sidney M. Cadwell, director of research and development for the United States Rubber Co. and holder of 69 patents on rubber inventions, has won the 1956 Charles Goodyear Medal of the American Chemical Society's Division of Rubber Chemistry, it was announced by John M. Ball, chairman of the jury of award. Dr. Cadwell's inventions range from the first commercial rubber antioxidant to the well known Cadwell-Geer golf ball cover.

•

Alkydol Appoints Agent

Alykdol Laboratories, Inc., Cicero, Ill., manufacturers of synthetic resins and allied products for the protective coating industries, has announced the appointment of Pacific Coat Chemicals as its West Coast representative.

Although Pacific Coast will represent Alkydol in the sale of all its products, it will be particularly active in the distribution of "Jel-O-Mer 903," a thixotropic vehicle for gel type paints, and "Alpex" resin, a new type of cyclicized rubber resin for paints, ink, and other protective coatings.

•

Many See Plastics Show

Nearly 30,000 individuals from all branches of business, industry, and government last month attended The Society of the Plastics Industry, Inc.'s seventh national plastics exposition at the New York Coliseum, according to William T. Cruse, executive vice president of the SPI.

•

CSMA Aerosol Survey

The latest survey of aerosol and pressurized product sales compiled by the Chemical Specialties Manufacturers Association shows that total sales of pigmented and metallic paints dropped from 8,203,687 in 1954 to 7,723,368 in 1955. Total sales of clear plastic sprays rose from 1,353,613 in 1954 to 1,524,142 in 1955, according to the survey.

•

Plant Capacity Doubled

The production capacity of polyvinyl acetate polymers has been doubled at the National Starch Products Inc. new Meredosia, Ill., plant, according to R. W. Merritt, vice president in charge of production.

The Big News in Polyols

THESE DEVELOPMENTS ARE REVOLUTIONIZING THE CONCEPT OF PE

There are many reasons why Hercules has been making *the* big news in PE developments.

Here are three:

First, the introduction of *non-dusting* Hercules® technical pentaerythritol. Its demonstrated advantages: easier to use, lowered dust hazard, no "fines" to collect on kettle walls.

Next, a wholly new *low-color* grade of Hercules technical PE. In this new grade, virtually *all* impurities are removed. The purpose: to give you as nearly as possible a "pure" 88%-12% blend of mono, and di-PE, which will deliver the reaction-time of technical PE and the extra color advantages of mono-PE.

And finally, the commercial availability of Hercules *Mono-PE* made to the same high purity standards—for those critical uses where both maximum hydroxyl content and absolute uniformity of properties are wanted.

There have been more developments, too—in product-availability, packaging, and applications. If we haven't kept you up to date, we'd like a chance to review all of them for your benefit. Your raw material position can be improved and our further developments can be guided by your specific needs.

Synthetics Department

HERCULES POWDER COMPANY

INCORPORATED

926 Market St., Wilmington 99, Del

look...
it's
TITANOX®

In trade sales products—particularly flat wall paints—only the composite TITANOX pigments give the best paint properties at *minimum titanium dioxide content.*

These rutile-calcium pigments—TITANOX-RCHT (30% TiO_2) and TITANOX-C-50 (50% TiO_2) are first choice for flats, semi-glosses and other more highly pigmented finishes.

Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

3850-A

abstracts

The following are abstracts of papers presented at the meeting of Division of Paint, Plastics, and Printing Ink Chemistry of the American Chemical Society, held in Dallas, Texas, April 8 to 13th.

Poly-α-Methylstyrene

G. D. Jones, R. E. Friedrich, T. E. Werkema, and R. L. Zimmerman, Physical Research Laboratory, The Dow Chemical Co., Midland, Mich.

α-Methylstyrene is polymerized by sodium catalysis. The properties of the plastic are described. It is colorless to faintly yellow, more solvent-resistant than polystyrene, of excellent electrical properties, and has a heat distortion point of 130° to 155°, depending on the amount of strain and residual monomer. The stability with respect to depolymerization and chain scission and the effect of molecular weight distribution on brittleness are discussed. In order to minimize depolymerization during molding and extrusion it is necessary to use good temperature control and a grade of polymer which has minimum melt viscosity and a good molecular weight distribution.

Developing Uses For Synthetic Silicas In The Lacquer Field

L. O. Young and D. P. Barrett, Davison Chemical Co., Baltimore 3, Md.

The inherent fascination in silica chemistry is the basis for this paper, which is essentially a chronicle of the problems encountered and overcome on the way to a successful commercial chemical development. It is also a glimpse into the interesting new fields for investigation which opened up as these problems were solved.

Starting with the need for finding a profitable use for fine silica, the authors touch briefly on the market research which led to the selection of the nitrocellulose lacquer field as the potentially most desirable outlet for this material. They then describe the technical problems that were solved in the laboratory work, leading to the adaptation of this synthetic silica to this market; they also show how variations in lacquer uses and formulations called for the development of synthetic sil ca variations to meet these requirements. The paper then describes some of the field problems encountered and concludes with a brief look into future developments in this field.

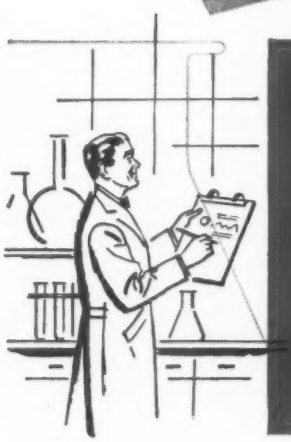
Cross-Linking Agents For Cellulose Derivatives

R. P. Hirt and G. N. Bruxelles, Experiment Station, Hercules Powder Co., Wilmington, Del.

Insolubility of cellulose derivative films and lacquer coatings in the solvents in which they normally dissolve—e.g., esters and ketones—is a desired property for many specialty applications. These include solvent-resistant furniture lacquers, aircraft lacquers resistant to attack by diester-type hydraulic fluids, and many applications where migration of plasticizers from other materials into lacquer coatings presents difficulty. Significant reduction of solubility would be expected to result if the proper degree of cross linking of the straight-chain cellulosic polymers was achieved.

Typical polyfunctional isocyanates and several titanium organic esters and titanium chelates were investigated as cross-linking agents on the basis of their expected reactivity with the free hydroxyls of several cellulose derivatives. These materials were added to solutions of the cellulose derivatives in concentrations which varied from 0 to 75% by

Get the DANIEL LITTER LABORATORIES report



Convince yourself that

FLEXBOND 800

Copolymer Polyvinyl Acetate

is Best for All-Around

Water-Base Paint Formulations

Recently, Daniel-Litter Laboratories, an outstanding independent laboratory for paint testing, ran a series of exhaustive tests on the leading water-base paint emulsions of all types. The paint formulations used were identical with those suggested in the manufacturers' technical literature. The emulsions and formulations selected for testing were those considered by the trade as the best available.

In test after test, conducted by this independent laboratory, Flexbond 800 Copolymer Polyvinyl Acetate Emulsion rated outstanding in these important properties: Film Integrity, Scrub Resistance, Sheen Uniformity, Easy Brushing and Package Stability. Flexbond 800 formulations were unique among all the interior emulsion paints tested in that they showed no negative features.

The Daniel-Litter Laboratories Summary Report is available for review with our representatives. Address Dept. F6

COLTON CHEMICAL COMPANY

A Division of Air Reduction Company, Inc. • 1747 Chester Avenue, Cleveland 14, Ohio

Sales Offices and Warehouse Facilities Throughout U. S.
EXPORT: Airco Company International, New York 17, N. Y.

weight of total solids. In those instances where immediate gelation did not occur, solutions were observed for viscosity stability, and free films were prepared and tested for solubility and mechanical properties.

Polyfunctional isocyanates, typified by toluene diisocyanate and triphenylmethane triisocyanate, were found too reactive with moisture and alcohols to be of practical value as cross-linking agents. Titanium esters such as tetra-n-butyl titanate generally caused immediate gelation when they were added to solutions of nitrocellulose or ethylcellulose.

Of the materials tested, titanium acetonate, a chelate formed by reaction of two moles of acetylacetone with one mole of tetraisopropyl titanate, permitted the best control. Cellulose derivative solutions and a typical nitrocellulose-alkyd resin lacquer which contained 1 to 40% titanium acetylacetonate exhibited viscosity stability for at least 4 months. Evidence of cross linking when films were cast and air-dried was shown by significant reduction of solubility and a general decrease in film flexibility. It was possible to obtain films of reduced solvent susceptibility from nitrocellulose (11 to 12% nitrogen), ethylcellulose (2.25 ethoxyl groups per anhydroglucose unit), and cellulose acetate (53% combined acetic acid) with only minor loss of mechanical properties by modification with 1 to 10% titanium acetylacetonate. The degree to which a cellulose derivative was cross-linked appeared dependent on the amount of free hydroxyl in the derivative.

Titanium esters can be hydrolyzed to a thin, continuous film of titanium dioxide which has been reported to improve adhesion of subsequent coatings to a variety of substrates. The formation of such a film on aluminum and steel did not result in improved adhesion of typical cellulose derivative lacquers.

Further work is in progress to determine the effects of titanium chelates as cross-linking agents on the properties of a wide variety of cellulose derivative coatings.

GET SURE 3-WAY PROTECTION

... with Nopco anti-foamers for latex paints!

FASTER PRODUCTION! Cuts excessive foaming during processing!

EASIER PACKAGING! Gives sure density control, no need to settle paint before packing!

BETTER BRUSHING! Avoids spotting, fish eyes or bubbles when applying!

And Nopco anti-foamers are truly economical to use also! We have a wide selection of proven anti-foamers . . . for all three major systems of latex paint. So the Nopco technical man can pick out the one best fitted to your specific needs. Why not write for further information today! Nopco Chemical Company, Harrison, N. J.

NOPCO

PLANTS: Harrison, N. J. Cedartown, Ga. • Richmond, Calif. London, Ont. Canada

Evaluating Check Resistance Of Furniture Lacquer Films

Roy M. Carter, Robert J. Hader, and Wm. J. Schrumpf, (Mower Lumber Co., Daily, W. Va.) North Carolina State College, Chapel Hill, N. C.

Acceptable methods of determining check resistance of lacquer films on wood products are time-consuming, subject to considerable variation, and expensive, resulting in ineffective laboratory quality control procedures for evaluating check resistance as formulations are modified to satisfy use requirements. The checking tendencies of lacquer film have been correlated with the distention-potential, which is a measure of the amount of deformation required to produce failure and corresponds with the flexibility. Flexibility tests were conceived as a means of determining the amount of distortion required for crack failure by using a range of bending mandrel sizes from 1/8 to 1-1/4 inches, over which the lacquer-coated (approximately 1/100 inch thick) metal sheets were bent.

Nine lacquers were selected representing a normal production range in check resistance. Two commercial lacquers of high and low check resistance were used and seven lacquers were prepared from two formulations of "hard" and "soft" lacquer, which by blending produced a range in hardness and check resistance representative of commercial lacquers.

The bending mandrel tests were conducted according to a sequential statistical technique called the "up and down" method. These results were correlated with conventional cold check cycle tests of finished plywood panels and the relationship between the two test methods was determined. The bending mandrel method for rapidly determining check resistance of lacquer films is recommended for laboratory control of finishing materials.

Deicing Lacquer For Stationary Aircraft

Clifford J. Rolle and William D. Barnes, Jr., Interchemical Corp., Research Laboratories.

One of the difficulties encountered by aircraft during the winter season is

the frequent accumulation of ice on the wings and fuselage while the plane is parked on an airfield or on the flight deck of a carrier ship. Before taking off on a scheduled flight or an assigned mission, it therefore becomes necessary to remove this adherent coating by the laborious and time-consuming process of knocking off with mallets or other tools.

This paper describes the development of a lacquer possessing very low adhesion for ice. This can be applied as a more or less permanent coating to the plane, so that removal can be accomplished easily and speedily. The method of measurement of ice release and the evaluation of various ingredients are described, leading to formulation of the optimum formulation.

A New Mechanism For Controlled-Temp. Application of Lacquers

Harold C. Fornwall, The DeVilbiss Co., Toledo, Ohio.

The design of a closed indirect hot water system to work as well with regular as with specially formulated lacquer finishes is now an accomplished fact. The system consists of three basic components: heat generator, heat exchanger, and heat jacketed fluid hose.

Simplicity in appearance, consistent operation, ease of installation, plus the safety features of this type of circuit and proved satisfactory field results provide the development background for this system. In addition, it provides a method of controlling the most elusive cause of trouble in the finishing room known as "inconsistent spray viscosity."

Adequate and positive control of temperature to ensure uniform spraying viscosity permits the use of lower atomization pressures, and provides speed and ease of application. Savings in material as well as manpower are but a part of the potential provided by this method.

Its use with the customer's regular cold spray materials brings about a new approach. All of this will continue to provide users with improved lacquer finishes at lower costs.

Effect of Contaminants in Corrosion Resistance to Painted Surfaces

Ralph J. Wirshing, Chemistry Department, Research Staff, General Motors Corp.

Laboratory testing of finishing materials many times produces results that are erratic and confusing. Using steel ordered under the same specification, there was a wide divergency in the test results on many occasions. These differences were blamed on faulty materials and poor control of processes and procedures.

GREENS

4 Pure Chromium Oxides
and
2 Hydrated Chromium Oxides

Most stable of the green pigments. Unaffected by acids, alkalis, vehicles, and solvents. Non-fading.

The 4 pure chromium oxides will withstand ceramic temperatures. Use them in applications requiring permanency—enamels, emulsion paints, rubber, plastics, floor coverings, roofing granules, building materials, etc.

Use the 2 hydrated chromium oxides for obtaining brilliant color and transparency in automotive finishes, high grade enamels and lacquers.

Your nearest Williams representative will be glad to provide you with full technical data and samples.

WILLIAMS
COLORS & PIGMENTS

EASTON, PA. • E. ST. LOUIS, ILL.
EMERYVILLE, CAL.

"A plasticizer for every purpose"

how to add a big selling point to your VINYL ACETATE PAINTS

with permanent KRONISOL® plasticizer

A longer lasting, better than ever polyvinyl acetate paint is yours with KRONISOL plasticizer.

In addition to better permanence the use of KRONISOL plasticizer improves *gloss, ultra-violet light stability* and *adhesion* to cinder block, stucco or cement. *Coalescence* of the deposited paint film is markedly better. Other properties imparted by KRONISOL plasticizer are equally as good or better than dibutyl phthalate.

If you are now manufacturing, or considering the manufacture of polyvinyl acetate paints, a look at the properties of KRONISOL plasticizer means a step towards a better product.

Technical data and samples of KRONISOL plasticizer are available and will be sent immediately upon request.

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

OHIO-APEX DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
NITRO, WEST VIRGINIA
Department 23

☐ Send technical data. ☐ Send KRONISOL sample.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

CALENDAR OF EVENTS

July 16-20. Gordon Research Conference, Organic Coatings, New Hampton School, New Hampton, N. H.

Aug. 13-15. Joint Convention of American Soybean Assoc. and National Soybean Processors Assoc., Univ. of Illinois, Urbana, Ill.

Sept. 16-21. American Chemical Society Meeting, Atlantic City, N. J.

Sept. 24-26. American Oil Chemists' Society Fall Meeting, Sherman Hotel, Chicago, Ill.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmilers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.

Detroit, 4th Tuesday,, Rachham Building.

Golden Gate, 3rd Monday, E. Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Bill Williams Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

New England, 3rd Thursday, University Club, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.

Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.

Rocky Mountain, 2nd Wesnesday.

St. Louis, 3rd Tuesday, Kings-Way Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Oak Room, Union Station.

Western New York, 1st Monday 40-8 Club Buffalo.

An investigation was undertaken to determine whether or not proper control of all steps in the test work would improve the reproducibility of test results. It was soon found that some other factor was influencing the results, and it was finally narrowed down to surface contaminants.

The work is described and proposed methods of removing the contaminants are discussed. This work may be an explanation for certain corrosion failures in service.

The Capacitive Index For Measuring Coating Deterioration

Manuel Shaw and Sumner B. Twiss, Engineering Division, Chrysler Corp., Detroit 31, Mich.

A method of measuring the deterioration of organic protective coatings has been developed, based upon the determination of the capacitance of a coated panel immersed in electrolyte. Expression of capacitance in terms of capacitive index, $CI = 1 + C_d/C_f$ where C_d and C_f are, ect. are thdouble layer and film capacitance, ree spectively, gives a unit by which coatings of different type or thickness can be quantitatively evaluated ona comparable basis. The capacitance technique has been applied to the study of deterioration of both air-dried and baked clear coatings on chromium plated steel and zinc die castings.

On the basis of both salt spray and outdoor exposure tests, it appears that when the double layer capacitance exceeds the film capacitance, deterioration proceeds very rapidly. Visible failure occurs usually at high values of capacitive index. The capacitive index indicates variations in the protective value of coatings before visible failure is evident. The capacitance method is nondestructive and rapid, and gives reproducible results.

Pyromellitic Dianhydride For Curing Epoxy Resins

R. B. Field and C. F. Robinson, Eastern Laboratory, Explosives Department, E. I. du Pont de Nemours & Co., Gibbstown, N. J.

Pyromellitic dianhydride, a compound having a high degree of functionality when used as a curing agent in mixtures with phthalic anhydride (PA) or maleic anhydride (MA), produces cured epoxy resins having higher heat distortion temperatures than those cured by phthalic anhydride or maleic anhydride alone. The heat distortion temperatures of epoxy resins crosslinked with mixtures of pyromellitic dianhydride and phthalic anhydride or maleic anhydride are increased by (1) increasing the proportion of pyromellitic dianhydride used at a given anhydride to epoxide ratio, (2) increasing the anhydride to epoxide ratio up to 0.85/1 (the ratio which gave the highest heat distortion temperatures), (3) increasing the curing time up to 24 hours, and (4) increasing the curing temperature. The heat distortion temperatures obtained (about 200°C. when the curing agent was a pyromellitic dianhydride-phthalic anhydride mixture and about 260°C. when the curing agent was a pyromellitic dianhydride-maleic anhydride mixture) are higher than those obtained when other commonly used epoxy resin curing agents are used. Resins cured by the pyromellitic dianhydride-maleic anhydride mixtures showed much better resistance to prolonged heat aging than did resins cured by pyromellitic dianhydride-phthalic anhydride mixtures.

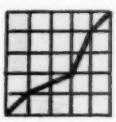
While the effect of varying the formulation or the curing cycle on the other properties has not been investigated in detail, the physical properties of the pyromellitic dianhydride-phthalic anhydride—and pyromellitic dianhydride-maleic anhydride-cured resins formulated to obtain the maximum heat distortion temperatures are comparable to and the electrical properties are superior to those reported for phthalic anhydride-cured resins. In addition, excellent corrosion resistance has been maintained. The significant retention of physical strength above the heat distortion temperature shown by epoxy resins cured by pyromellitic dianhydride mixtures may make it possible to utilize the cured resins at or above the heat distortion temperature. The increased resistance to stress at elevated temperatures reported to be obtained when curing agents have increased functionality or increased compactness has been confirmed.

STILL UNSURPASSED...
In Color and Sheen Uniformity!

Across the nation an ever-increasing number of paint manufacturers are discovering the unique properties of paints based on FAFL.

Wherever flat paints must stand up to a demanding challenge—the utmost in color uniformity—sheen uniformity—color retention—washability—easy application—durability and long pleasing appearance—for interior or exterior surfaces—paints based on FAFL are providing unsurpassed performance.

Increase your alkyd flat paint sales with FAFL



FAFL-OD for Odorless Paints is a great sales-getter. Used also for government specification paints.
Write for samples and complete information.

FARNOW
Varnishes* INC. *Alkyds
4-83 - 48th Avenue
Long Island City 1, N. Y.

SPECIFICATIONS	
VISCOSITY	V-Y
NON-VOLATILE	30% ±1%
COLOR	6 Maximum
ACID NO.	10 Maximum (on solids)
WEIGHT per gal.	7.3 lbs.
TYPE	Pure drying oil alkyd

Manufacturers of:
ALKYDS — SPECIFICATION LIQUIDS — SPAR VARNISHES — SYNTHETIC VARNISHES — GLOSS OILS — ESTER GUMS — SOLUTION — PROCESSED OILS — RESIN SOLUTIONS — DRIERS — GRINDING LIQUIDS — MARINE FINISHES — ARCHITECTURAL VEHICLES — INDUSTRIAL VEHICLES

LACQUER FOR PLASTICS

(*From page 29*)

metallic film. This clear coating is a necessity for the protection of the thin, delicate film of metal applied by vacuum metallizing processes. Lacquers containing polar solvents are not satisfactory for this use because the solvents tend to soften the underlying plastic surface and reduce the gloss of the metallized coating.

Lacquers based on ethyl hydroxyethyl cellulose (EHEC), which is soluble in nonpolar solvents such as aliphatic hydrocarbons, can be used to coat vacuum metallized plastics. A thin coat (a 0.3-mil dry film) of the formulation shown in Table 6 has been used on cellulose acetate plastic and probably would also be satisfactory on various types of polystyrene and methyl methacrylate. Metallized cellulose acetate articles coated with this lacquer have excellent gloss, and the lacquer film shows good adhesion and hardness.

	Parts by Weight 1	2
Solids Content[1]		
RS Nitrocellulose, 5-6 sec.	100	43.5
Cellolyn 502 (Nonoxidizing Alkyd Resin)	–	43.5
Dibutyl Phthalate	–	13
Solvent Combination		
Acetone	75	–
Amyl Acetate	25	24
Methyl Ethyl Ketone	–	70
Xylene	–	6
Total Solids for Spray Application, Per Cent	7	13
Viscosity, No. 4 Ford Cup, seconds	25	26

1 Typical pigments and dyes can be incorporated by normal techniques.

Table 5. Lacquers for acrylic plastics.

	Parts by Weight
Ethyl Hydroxyethyl Cellulose (20-cp. Type)	8.5
Amsco D	41.5
V. M. and P. Naphtha	41.0
Butanol	9.0
	100.0
Total Solids for Spray Application, Per Cent	8.5
Viscosity, No. 4 Ford Cup, Seconds	28

Table 6. Ethyl hydroxyethyl cellulose lacquer for metallized plastics.

Many plastic articles are coated to obtain special effects and improved appearance. Specific lacquer formulations have been described which give good adhesion to various difficult-to-coat plastics such as cellulose acetate, polystyrene, the phenolics, and Mylar.

References

(1) Modern Plastics, January, 1956

(2) U. S. Patent 2,684,310 includes other formulations for application to polymethyl methacrylate plastics.

New Books

Polyesters and Their Applications

By Johan Bjorksten, Henry Tovey, Betty Harker, and James Henning (all of Bjorksten Research Laboratories, Inc.). Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. Price $10.00.

This book is a comprehensive survey of the entire polyester field from raw materials to fabricated products. Over 3300 references covering most phases of the production and use of polyesters are included. Patents or literature bearing on some particular phase of the polyester field can be quickly located. The authors discuss unsaturated polyesters used in molding, casting, coating, impregnating, and laminating and also saturated polyesters used in the production of fibres, films, elastomers, and foamed plastics.

Early chapters deal with the theoretical concepts of high polymers, raw materials and processes used in the manufacture of polyester resins, and a detailed discussion of catalysis and inhibition.

Commercial resins, their manufacturer or suppliers, and properties are included in this volume.

The Chemical Constitution of Natural Fats — Third Edition

By T. P. Hilditch. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Price $16.00.

Dr. Hilditch supplies a complete account of the constitution of fats, and especially the glycerides, which are produced naturally in plant and animal life. Treating the natural fats as a group of organic chemical compounds, the volume aims primarily at a descriptive presentation, viewed in the light of present knowledge.

Three chapters cover the component acids of fats of aquatic flora and fauna, land animals, and vegetable fats. Dr. Hilditch then studies the component glycerides, including a general survey and separate chapters for individual vegetable and animal fats. A discussion of various aspects of the biosynthesis of fats also receives a special chapter, followed by one on the constitution of individual natural fatty acids, and another on synthetic glycerides: individual naturally occurring fatty alcohols and acyl ethers of glycerol. In conclusion, the author provides extensive notes on the experimental technique employed in the quantitative investigation of fats. The book takes in the records of approximately 1000 fats.

Dr. Hilditch is professor emeritus of industrial chemistry, the University of Liverpool.

New A-D-M Address

A new address for the Archer-Daniels-Midland Company's New York office has been announced by Paul McClay, assistant vice president in charge of sales for the company's New York office and six Atlantic seaboard states. Formerly located in the Woolworth Building, the office has been moved to Room 1600, Transportation Building, 225 Broadway. The telephone number, Digby 9-0750 is unchanged.

•

New Steel Drum Facility

The Newark Steel Drum Co., Linden, N. J., has put its new facility for the manufacture of steel drums into production, it was announced by W. J. McEntee, president.

Nat. Starch Miami Office

The resin division of National Starch Products Inc., has established a Miami office at 3675 N. W. 71 St. Burton I. Fink, who for the past two years has serviced the Miami area from the Atlanta office, will be in charge. In addition, National has made arrangements with the Colonial Warehouse in Miami to carry a complete stock of its resins for the paint industry.

•

Phila. Club Picks Teacher

William H. Gregory, special assistant in science in the Philadelphia public school system was selected by the Philadelphia Paint & Varnish Production Club to attend the paint short course at North Dakota State College.

Yours For The Asking

BULLETINS ON
WET GROUND MICA IN PAINT

•

COMPILATIONS OF FORMULAS OF LEADING LATEX MANUFACTURERS RECOMMENDING MICA

•

TECHNICAL BULLETINS
BASED ON WGMA RESEARCH PROGRAM

•

RECENT BULLETINS:

An Opaque Window Paint Based on the Light-scattering Effect of Wet Ground Mica

The Present Use of Wet Ground Mica as an Extender in Outdoor Latex Paints

Studies on the Influence of the Amount of Wet Ground Mica Used in Outdoor Polyvinyl Acetate Latex Paints

Ask to be placed on the regular Association mailing list.

WET GROUND MICA ASSOCIATION, INC.

420 LEXINGTON AVE.
NEW YORK 17, N. Y.

WGMA

TELEPHONE:
LEXINGTON 2-3988

TECHNICAL Bulletins

LATEX PAINTS

What is latex? What are the different kinds and how do they compare? Are latex paints available for interiors and exteriors? Where can a dealer recommend use and where should he caution it? Answers to these questions and others are available in an attractive easily read booklet prepared for paint dealers.

The booklet deals with the three types of latex paints in use today: styrene-butadiene, polyvinyl acetate, acrylic. The use of these three types of paints on various surfaces is discussed so that a dealer may better answer the perplexing questions of consumers. Available from the plastics merchandising section, plastic sales department, The Dow Chemical Co., Dept. PVP, Midland, Mich.

POLYETHYLENE FILM

"New Extra-Wide Polyethylene Film Can Solve Many Problems in Chemical Field," is the head on the featured story of the May-June issue of "U.S.I. Chemical News," published by U. S. Industrial Chemicals Co., Dept. PVP, 99 Park Ave., New York 16, N. Y. Also included in this issue is a column of technical developments in the industry.

CYCLOHEXANONE

National Aniline Division, Allied Chemical & Dye Corp. has issued Technical Bulletin I-19 on "Nadone" (Cyclohexanone). This 32-page bulletin contains what the company believes to be the most complete data yet to be assembled on this unusual solvent and chemical intermediate. It contains 17 pages describing physical and chemical properties, and describes and illustrates all principal reactions. It also provides seven pages of suggested uses in such applications as a rubber-base composition, paint remover, plasticizer, as a valuable ingredient in printing inks, adhesives, and as a basic solvent in insecticide and fungicide sprays and many other present and potential uses. Appended is a comprehensive bibliography of 178 literature references. A copy may be secured from National Aniline Div., Allied Chemical & Dye Corp., Dept. PVP, 40 Rector St., New York 6, N. Y.

FATTY ACIDS

A four-page brochure tabulating the specifications and components of Groco fatty acids has been released by A. Gross & Co., Dept. PVP, 295 Madison Ave., New York 17, N. Y., manufacturers of fatty acids for industry since 1837. The brochure permits the reader to see at a glance all vital data on A. Gross stearic, oleic, tallow and vegetable fatty acids. Also included is a list of distributors throughout the country.

WATER GROUND
MICA
ALSIBRONZ
EXTENDER PIGMENTS
for:
PRIMER-SEALERS
HOUSE PAINTS
LATEX-EMULSIONS
FRANKLIN MINERAL PRODUCTS
COMPANY
FRANKLIN, NORTH CAROLINA
CORPORATED 1926
Agents in Principal Cities

METAL WIRE CLOH

Multi-Metal Wire Cloth Co., Inc., 1350 Garrison Ave., New York 59, N. Y., has initiated and will issue periodically a house organ called "Multi-Matter" that presents information on the company's latest developments, products and applications.

This first issue, and the succeeding ones will attempt to present much useful information dealing with solids-liquidsseparation: straining, filtration, slurry washing, concentration, ion exchange, etc. Company will be glad to send copies on request.

INFRARED HEATING

The Fostoria Pressed Steel Corp., Dept. PVP, Fostoria, Ohio, has published Vol. I, No. I, of "Radiant Heating News," which will endeavor to help paint men to properly evaluate infrared heat in the drying of the products they sell, and help to keep them well informed on latest infrared developments. This first issue also outlines by means of actual installations the benefits obtained through infrared drying.

MICA
WATERGROUND AND MICRO
For DURABLE and UNIFORM PAINTS
ENGLISH MICA is the Most Uniform. It always meets government specifications and fineness of grind tests.
ENGLISH MICA is More Uniform because of a single large source of supply from our own domestic mines.
The English Mica Co.
STERLING BUILDING, STAMFORD, CONN.

RESIN DISPERSIONS

The widespread use of "Dresinol" resin dispersions in conjunction with GR-S type latex to improve properties and lower costs, in a variety of applications, is described, in a new technical booklet available from Hercules Powder Co., Dept. PVP, Wilmington 99, Del.

Dresinol is the name applied to a series of 40-45 per cent solids, solvent-free, aqueous, dispersions of rosin-derived resins.

The booklet illustrates by specific, detailed data the properties contributed when Dresinol dispersions are used to modify each of four high-polymer materials: GR-S, neoprene, natural rubber, and polyvinyl acetate.

ACCIDENT PREVENTION

The National Safety Council has published a new and greatly expanded edition of its Accident Prevention Manual for Industrial Operations.

Designed as the basic text for the safety man's shelf, this 3rd edition includes all the information needed to organize a comprehensive safety program and keep it going. In addition there are many informative chapters covering the specific types of hazards found in most industrial operations.

The 1341-page encyclopedia is priced at $13.50 and may be purchased from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. For those desiring more complete information on the subject matter covered, a descriptive folder will be sent on request.

CASTERS and WHEELS

A new four-page condensed catalog showing the full line of Rapistan casters is now available from The Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.

Exclusive features of Steel Forged, Cold Forged, and Stamped Steel in classifications from light (150 lbs.) to heavy (3000 lbs.) duty are described, and recommended uses for each of the series are listed.

Also illustrated and described are eight types of wheels with a wide range of performance characteristics for almost every industrial and commercial application.

STEEL STRAPPING

A new 44-page steel strapping catalog, containing constructive ideas to help speed packaging, lower handling costs and achieve safe shipment, has been published by Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.

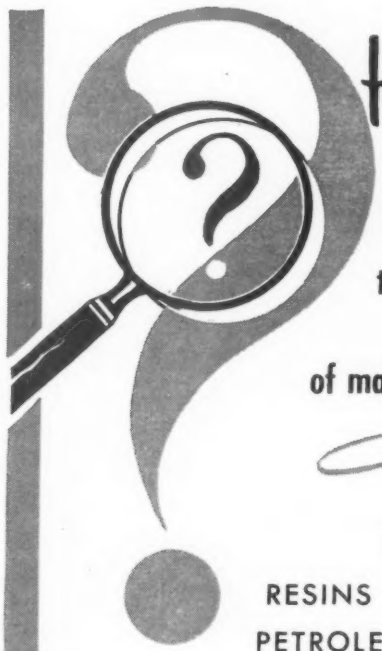
The booklet contains more than 65 drawings and photographs showing practical, proven steel strapping applications that are in use today. Five basic ways of using steel strapping are described including reinforcing, palletizing and skidding, bundling, baling and tying. A complete description of steel strapping tools and equipment is also included.

EPOXY COMPOUNDS

Company's new long-chain epoxidized olefins, Octylene oxide, Dodecene oxide, and $C_{16}C_{18}$ Olefin oxide are described in Bulletins Nos. 72, 73 and 74, respectively, published by Becco Chemical Division, Food Machinery and Chemical Corp., Dept. PVP, Buffalo 7, N. Y.

Structure, typical properties and chemical reactivity of each of these highly reactive epoxy compounds are presented. A number of suggested uses as intermediates, solvents, and specialty chemicals are listed.

(*Turn to page 97*)



Have you examined

Rhodia's odor control chemicals for reducing the intensity and objectionable characteristics of malodors when using

CRUDE TALL OILS
TURPENTINE
XYLOL • TOLUENE
RESINS • VEGETABLE OILS
PETROLEUM HYDROCARBONS

We have available specially-designed odor control chemicals, such as Alamask® TAL for tall oils; Alamask EK for varnishes and lacquers and Alamask CY, CE and CC for solvents, such as mineral spirits. They are low in cost and require infinitesimal quantities for effective results.

Our technical engineering service is available to consult with you on your odor problems, whether they be product or processing malodors. We invite your inquiries.

Rhodia INC.

60 East 56th Stret, New York 22, N. Y.

PHILADELPHIA • CINCINNATI • CHICAGO • LOS ANGELES
CANADA: NAUGATUCK, MONTREAL • CUBA: LUIS FELIPE, HAVANA
MEXICO: COMMERCIALE REKA, MEXICO

ONE STOP • ONE STOP • ONE STOP • ONE STOP • ONE STOP SERVICE

FOR ALL COLORS, MINERAL FILLERS AND PIGMENTS

ASBESTOS
BARYTES
BENTONITE
BLANC FIXE
BLUES
BROWNS
CALCIUM CARBONATES
CARBON BLACK
CHROME COLORS
CHROMIUM OXIDES
CLAYS
COPPER OXIDE
GILSONITE
GRAPHITE
IRON OXIDES
LAMP BLACK
LITHARGE
LIME
LITHOPONE
MAGNESIUM CARBONATE
MAGNESIUM OXIDES
MANGANESE OXIDE
MICA
PUMICE STONE
REDS
RED LEAD
SIENNAS
SILICAS
STEARATES
TALCS
TALL OIL
UMBERS
YELLOW OCHRES
ZINC OXIDE
ZINC YELLOW

Serving Effectively for Nearly Four Decades

SMITH CHEMICAL & COLOR CO., INC.
55 JOHN STREET BROOKLYN 1, NEW YORK
FABRICATORS OF MINERAL COLORS—Agents for NATIONALLY KNOWN MANUFACTURERS

Have You Ordered Your Subscription To

PAINT and VARNISH PRODUCTION

If you wish to have PAINT and VARNISH PRODUCTION mailed to you every month, just send your remittance today.

Only $3.00 per year
$5.00 for Two Years

Valuable, practical articles in every issue by leading experts in their fields on all phases of paint and varnish production! Don't miss any issues . . . enter your subscription now!

Make checks payable to

POWELL MAGAZINES, INC.
855 Avenue of the Americas
New York 1, N. Y.

EPOXIDATION—(*From page 36*)

compositions. Pyrolyis of epoxy-stearates leads to conjugated dienes which dry relatively fast.

Paint and Varnish Compositions: Compositions resulting from reaction of polyhydric phenols and polyepoxides are reported to be useful in paints and varnishes.

Resin Coatings: Epoxy resin coating materials have been discussed above. In addition to these, urea-formaldehyde and phenol-formaldehyde resins can be cross linked by means of epoxides.

Lubricants: Ether-esters prepared from epoxystearic acid are reported to be stable, water-insoluble compounds useful as lubricants. Heating an alkylene sulfide with an epoxide gives linear copolymers with improved oxidation stability. Certain amine-alkylene oxide polymers are valuable as synthetic lubricants for use in internal combustion engines. Lubricating oils are given rust-inhibiting and improved oiliness characteristics by the addition of compounds containing an epoxide linkage. Metal salt derivatives of epoxystearic acid are also of possible use as oil and grease additives.

Surface Active Products: Polymeric products having surface active properties are produced by subjecting certain resins to oxyethylation with and alpha, beta-alkylene oxide. Alcohols, phenols, acids and amines can be oxyalkylated to give nonionic surface active agents.

Detergents: Water-soluble, polymeric detergents can be prepared from an alkylphenol, formaldehyde and an alkylene oxide.

Insecticides: The potency of certain insecticides is increased nearly fourfold by introduction of the epoxide ring. The epoxide of a chlorinated tetrahydroindene derivative is useful for the control and destruction of insects.

Synthetic Waxes: Amides of epoxystearic acid are reported to be of interest as high melting point waxes.

Brake Fluid: A composition resulting from epoxidation and ring-opening of soybean oil or rice oil is claimed to be of use in brake fluids.

Emulsifier: Hydroxylated lecithin has found use as an emulsifier for edible use and for the modification of starch to give useful sizing lubricants for textiles.

Chemical Intermediates: Epoxidation of allylmalonic esters provides very reactive compounds of interest in organic synthesis. Likewise, epoxidation of aliphatic, monoolefinic compounds, such as octene, provides useful solvents, chemical intermediates and potentially valuable reactants for preparing and curing epoxy resins.

Miscellaneous: Epoxides have also found use in pharmaceuticals, steroids, as solvents, for fireproofing, as impregnants, in making rubber-like materials, as cytotoxic agents, in isomerization to aldehydes, and in the prevention of fermentation and mold formation.

In conclusion, although some of the above-described reactions may not be directly related to the surface coatings and allied industries, the reactions are of interest and by adaptation may find utility in those areas.

MICA

WATER-GROUND "AT ITS BEST"

WHITE
PURE
UNIFORM

WAREHOUSE STOCK
IN CHICAGO—CALL
FRED A. JENSEN
510 N. Dearborn St.,
Tel. Superior 7-3809
Send For
SAMPLES AND PRICES
CONCORD
MICA CORP.
PENACOOK, N. H.

WANTED—

PAINT CHEMIST

BS or MS

Three Years Minimum Experience in Industrial Coating, Formulating and Testing.
Major Oil Company in Gulf Coast Area.

Box 700

PAINT & VARNISH PRODUCTION
855 Avenue of Americas

(*From page 95*)

ADHESIVES

Technical Bulletin C-6-230, entitled "Penacolite Brittle Resins B-1A, B-16, B-22," describing the properties of these specialized adhesives, has been issued by the Chemical Division, Koppers Co., Inc., Dept. PVP, 1301 Koppers Building, Pittsburgh 19, Pa.

The eight-page bulletin outlines their physical and chemical properties and their various uses. Specifically, the description, typical properties, physical and cure characteristics, applications, and storage and handling recommendations for these adhesives are presented in detail.

NITROPARAFFIN

Commercial Solvents Corp., Dept. PVP, 260 Madison Ave., New York 16, N. Y., has issued a 47-page brochure containing the full texts of papers presented at the series of Nitroparaffin Symposiums held recently in New York, Chicago, and San Francisco under its auspices. At these symposiums, representatives of companies working directly with the NP's and their derivatives presented their findings before industrial research and process development managers.

MICA IN PVA PAINTS

Technical Bulletin No. 25, "Studies on the Influence of the Amount of Wet Ground Mica used in Outdoor Polyvinyl Acetate Latex Paints. Part I," is available from the Wet Ground Mica Association, Inc., Dept. PVP, 420 Lexington Ave., New York 17, N. Y.

FORMALDEHYDE

Heyden Chemical Corp., Dept. PVP, 342 Madison Ave., New York 17, N. Y., has published a new technical bulletin, "Formaldehyde," summarizing properties and uses of this important, versatile, organic intermediate.

Detailed information on techniques of safe handling, materials of construction, storage and analysis are presented, based on Heyden's experience in the manufacture of formaldehyde since the company pioneered in the commercial production of this multi-use organic chemical in 1904.

Advance Info

Surface Active Agent Advawet #33- Tops for Emulsion Paints

A non-ionic, 100% active, surface active agent, ADVAWET #33 is tailor-made for the non-ionic emulsifying and wetting-out of practically all types of emulsion paints.

Developed by ADVANCE, and recommended by leading manufacturers, ADVAWET #33 is —

- Soluble—in water in all proportions, most organic solvents and oils.
- Compatible—with soaps, sulfonated oil and synthetic detergents.
- Stable—against metal salts, acids and alkalies.
- Practically Non-Foaming.

Samples and complete data on ADVAWET #33 are available. Write for yours today.

ADVANCE
SOLVENTS & CHEMICAL
DIV. OF CARLISLE CHEMICAL WORKS, INC.
NEW BRUNSWICK, N. J.

ADVERTISERS' INDEX

Abbe Engineering Co.	June
Advance Solvents & Chemical Div., Carlisle Chemical Works, Inc.	97
Alkydol Laboratories, Inc.	12
American Cyanamid Co., (Pigment Div.)	June
American Cyanamid Co., (Plastics & Resins)	3rd Cover
American Zince Sales Co.	56
Archer-Daniels-Midland Co.	14, 15
Arizona Chemical Co.	59
Armour & Co.	June
Aromatic Products Inc.	65
Atlas Electric Devices Co.	June
Bakelite Company, A Div. of Union Carbide and Carbon Corp.	50, 51
Baker Castor Oil Co.	June
Barrett Div., Allied Chemical & Dye Co.	6
Borg-Warner Corp., Marbon Chemical Division	16
Carbide & Carbon Chem's Co., a Div. of Union Carbide & Carbon Corp.	17
Cargill, Inc.	54
Celanese Corp. of Amer., Chemical Div.	44, 45
Celanes Corp. of Amer., Plastics Div.	69
Colton Chemical Co., Div. Air Reduction Co., Inc.	87
Columbian Carbon Co., (Mapico Color Div.)	8
Columbian Carbon Co. (Carbon Black)	8
Commercial Solvents Corp.	June
Concord Mica Corp.	97
Continental Can Company	24, 25
Continental Carbon Co.	June
Coors Porcelain Co.	June
Corn Products Refining Co.	67
Davies Can Co., The	June
Davison Chemical Co., Div. W. R. Grace & Co.	46
J. H. Day Co.	75
Dicalite Division, Great Lakes Carbon Corp.	72
Dow Chemical Co.	64
DuPont de Nemours & Co., E. I. (Electrochemicals)	June
DuPont de Nemours & Co., E. I. (White Pigments)	Apr.
DuPont de Nemours & Co., E. I. (Pigment Dept. Colors)	June
The Eagle-Picher Co.	66
Eastman Chemical Products Co., Inc.	9
English Mica Co.	94
Enjay Co., Inc.	June
Farnow, Inc.	91
Fein's Tin Can Co.	June
Firestone Plastics Co.	June
Franklin Mineral Products Co.	94
General Tire & Rubber Co.	48
Georgia Kaolin Co.	4th Cover
Glycerine Producers Ass'n	June
Goodyear Tire & Rubber Co. Inc., Chemical Div.	June
Grace Chemical Co.	June
Gross & Company, A	June
Harshaw Chemical Co.	60
Harshaw Chemical Co. (Zinsser & Co., Inc.)	June
Hercules Powder Co.	84, 85
Heyden Chemical Co.	June
Herman Hockmeyer & Co.	June
Hope Machine Co.	June
Imperial Paper & Color Corp.	June
Johns Manville Corp.	70
Kellogg & Sons, Inc., Spencer	20
Kentucky Color & Chemical Co.	63
H. Kohnstamm & Co.	June
J. M. Lehmann Co.	52
Liquid Carbonic Corp.	73
Mapico Color Div., Columbian Carbon Corp.	8
Marbon Chemical Div., Borg-Warner Corp.	16
McDanel Refractory Porcelain Co.	81
Metasap Chemical Co.	June
Monsanto Chemical Co., Plastics Div.	80
Monsanto Chemical Co. Organic Div. Plasticizers	22, 23
Naftone, Inc.	June
National Aniline Div., Allied Chem. & Dye Corp.	21
National Can Co.	June
National Lead Co.	11
Neville Chemical Co.	61
New Jersey Zinc Co.	June
Newport Industries, Inc.	Front Cover
Nopco Chemical Co.	88
Nuodex Products, Inc.	26
Ohio-Apex Div., Food Mchy. & Chem. Corp.	90
Oronite Chemical Co.	62
Pacific Vegetable Oil Co.	74
Pan American Chemicals, Div. Pan American Refining Co.	55
Patterson Foundry & Machine Co.	13
Penna. Industrial Chem. Corp.	June
Petrometer Corp	June
Phillips Petroleum Co.	43
Photovolt Co.	98
Pittsburgh Coke & Chemical Co.	71
R-B-H- Dispersions	78
Reichard-Coulton, Inc.	68
Reichhold Chemicals Inc.	4
Rhodia, Inc.	95
Rohm & Haas Co.	June
Chas. Ross & Son Co.	49
St. Joseph Lead Co.	June
Schenectady Varnish Co.	3
Sharples Chemicals, Inc.	June
Shawinigan Resins Corp.	18
Shell Chemical Co.	2nd Cover
Shell Oil Co.	10
Sinclair Chemicals, Inc.	19
Smith Chemical & Color Co.	96
Socony-Mobiloil Co., Inc.	58
Solvents & Chemicals Group	83
Sparkler Mfg. Co.	June
Standard Ultramarine & Color Co.	92
Sun Oil Co.	47
Tamms Industries, Inc.	98
Titanium Pigment Corporation	86
Troy Chemical Co.	82
Troy Engine & Machine Co.	79
Union Bag & Paper Co.	76, 77
Union Carbide and Carbon Corporation, Bakelite Company	50, 51
Union Carbide & Carbon Corp., Carbide & Carbon Chem. Co.	17
Van Ameringen-Haebler, Inc.	June
Velsicol Chemical Corp.	53
Vulcan Steel Container Co.	June
Wet Ground Mica Ass'n.	93
Williams & Co., C. K.	89
Witco Chemical Co.	June
G. S. Ziegler & Co.	May
Zinsser & Co. Inc., Sub. Harshaw Chemical Co.	June
William Zinsser & Co.	June

The Smart Trend in

PVA EXTENDERS!

Tamms GOLD BOND SILICA

A functional extender pigment especially adapted to PVA formulation for scrubability, leveling and flat sheen. It is easily wetted and dispersable. pH of 6.5–6.8. Non-crystalline structure. Economical in cost.

Dept RM-11
TAMMS INDUSTRIES, INC.
222 W. LA SALLE ST. CHICAGO 1, ILL.

PHOTOVOLT
Photoelectric GLOSSMETER

For reliable gloss measurements according to ASTM D523-53T on

Paints, Varnishes and Lacquers

Also for

- **Tristimulus Colorimetry with 3 Filters**
- **Sheen Measurements at 85 Degree Incidence**
- **Dry Hiding Power and Infra-Red Reflectance**

in accordance with Federal Specifications TT-P-141b

Portable, rugged, simple to operate

Write for Bulletin #677 to
PHOTOVOLT CORP.
95 Madison Avenue New York 16, N. Y.

Abstracts from Cyanamid's Technical Data

CYCOPOL® RESIN 341-17

METHYLSTYRENE COPOLYMER

Gives you very fast-drying speed and solubility in Aliphatic Solvents

CYCOPOL Resin 341-17 is a very fast-drying copolymer resin supplied in VM&P Naphtha for aliphatic solvent tolerance.

Suggested applications: paper coatings . . . polystyrene coatings . . . implement enamels . . . traffic paints . . . floor finishes.

The resin responds well to small amounts of cobalt naphthenate driers. For example – with the addition of 0.01% cobalt metal, based on the nonvolatile resin, 3 mil wet films of CYCOPOL 341-17 dry tack free in 15 minutes and develop good overnight hardness.

WRITE TODAY
for complete technical data report on CYCOPOL 341-17 . . . or other fast-drying copolymer resins (specify type of application). These data sheets come punched and ready for filing.

Offices: Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Detroit • Los Angeles • New York
Oakland • Philadelphia • St. Louis • Seattle *In Canada:* North American Cyanamid Limited, Toronto and Montreal

How HYDRITE Kaolinites affect GLOSS

in Polyvinyl Acetate Emulsion Paints

Previous advertisements in this series have shown the effect of particle size distribution of HYDRITE Kaolinites on important properties of butadiene-styrene latex paints. Beginning with this advertisement, the effect of particle size on properties of polyvinyl acetate emulsion paints will be discussed.

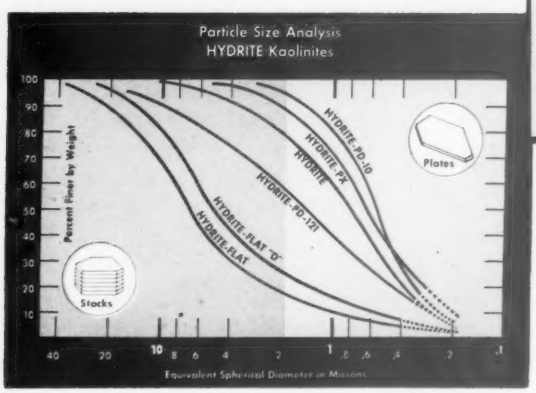
In butadiene-styrene systems, kaolinite particle size has an important effect on gloss. The same is true in PVAc systems, however, *the degree to which it is true depends on the individual emulsion used.*

Curves at the right were obtained by using the different grades of HYDRITE Kaolinites in two internally plasticized PVAc emulsions.

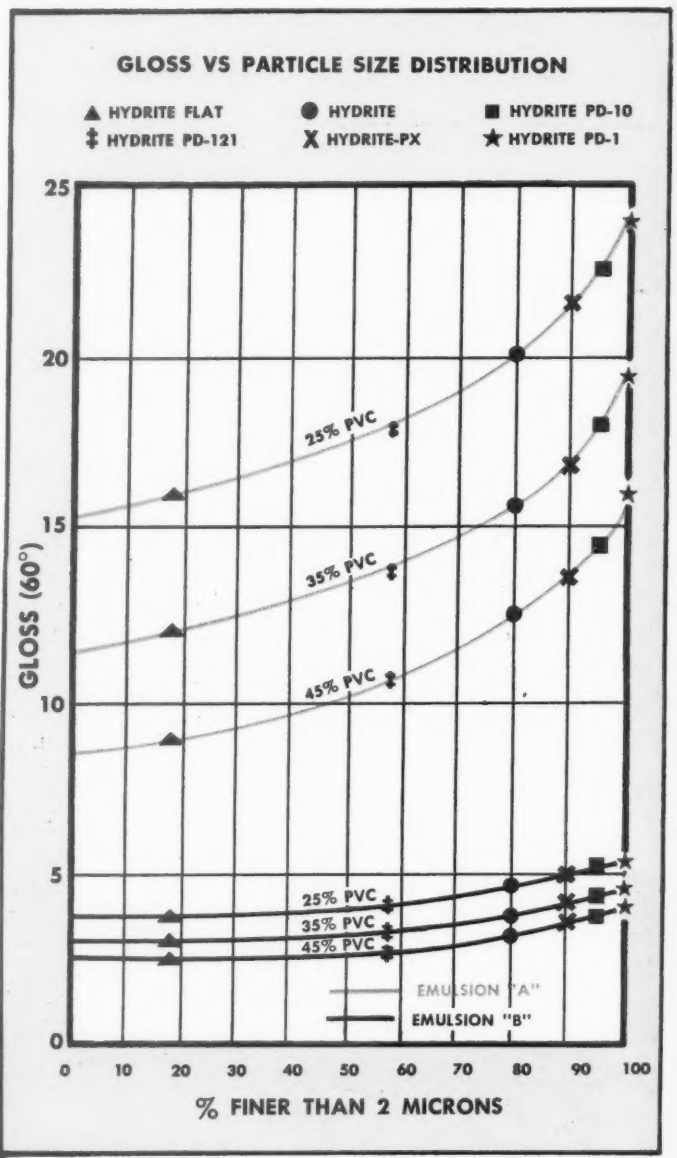
Notice that in Emulsion "A", kaolinite particle size has the expected effect on gloss. In Emulsion "B", however, the effect of particle size on gloss is negligible for all practical purposes. This marked difference between emulsions indicates that an evaluation of the effect of kaolinite particle size on gloss may be a valuable means of determining an important emulsion property.

Technical Service Bulletin TSBH-12 giving further details is now available.

WRITE
FOR YOUR COPY



#5 in a series describing the effect of kaolinite particle size on important properties of various paint systems.



GEORGIA KAOLIN COMPANY

435 North Broad Street, Elizabeth, N. J.